NATIONAL MUSEUM OF VICTORIA R. Prescott

Vol. XXIII. Part 10.

[Registered at the General Post Office, Melbourne, for transmission by Post as a Newspaper.]

The Journal of the Department of Agriculture of Victoria, Australia.

October, 1925.

PRINCIPAL CONTENTS

Port
Pig Farming
Cold Storage of Pears
Plum and Prune Culture
Potato Experiments
Wheat and Oat Experiments
Classing Farmers' Wool

PRICE THREEPENCE. (Annual Subscription—Victoria, Inter-State, and N.Z., 3/-; British and Foreign, 5/-.)

Better Seeds — Better Crops

KIKUYU GRASS

Converts Poor, Speargrass Country into Good, Pastoral Land.

A SPLENDID investment for every farmer, being easily and cheaply established and thoroughly permanent. A highly nutritive and palatable Summer Fodder, can be grazed, cut and fed green, or made into hay. Excellently adapted to poor, sandy land, and grows well on any loose soil.

ROOTS ONLY—Write for further particulars and Prices.

SUMMER FODDERS

Are an Insurance against Drought!

SUDAN GRASS	JAPANESE MILLET	AMBERCANE
SORGHUM	SWEET CLOVER	IMPHEE
BUCKWHEAT	SUNFLOWER	SEED MAIZE
	PEANUTS	

Sow Brunning's Re-machined Summer Fodders for Best Results

BRUNNINGS

F. H. BRUNNING Pty. Ltd.

64 ELIZABETH ST., MELBOURNE

NATIONAL MUSEUM OF VICTORIA

THE JOURNAL

OF

THE DEPARTMENT OF AGRICULTURE,

VICTORIA, AUSTRALIA.

CONTENTS.—OCTOBER, 1925.

		PAGE
Port	*F. de Castella*	577
Pig Farming	*A. J. Gill*	594
Cold Storage of Pears	*J. E. Harrison, B.Ag.Sc.*	603
How to Lay Out a Packing Shed	*Basil Krone*	608
Plum and Prune Culture	*J. M. Ward*	610
Potato Experiments, 1924-25	*J. T. Ramsay*	618
Farmers' Field Day at State Research Farm		622
Experiments with Wheat and Oats at State Research Farm		624
Egg-Laying Competition—Winter Test	*W. C. Rugg*	629
Classing Farmers' Wool	*G. W. McDonald*	633
Orchard and Garden Notes		638
Reminders for November		639

COPYRIGHT PROVISIONS AND SUBSCRIPTION RATES.

The Articles in the Journal of the Department of Agriculture of Victoria are protected by the provisions of the Copyright Act. Proprietors of newspapers wishing to republish any matter are at liberty to do so, *provided the Journal and author are both acknowledged.*

The Journal is issued monthly. The subscription, which is payable in advance and includes postage, is 3s. per annum for the Commonwealth and New Zealand, and 5s. for the United Kingdom and Foreign Countries. Single copy, Threepence.

Subscriptions should be forwarded to the Director of Agriculture, Melbourne. A complete list of the various publications issued by the Department of Agriculture will be supplied by the latter.

W. & W.
984

Cyclone

METAL GATES AND FENCES

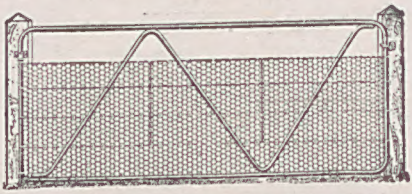


Fig. 132. Cyclone "N" Paddock Gate with round corners swung on face of posts. Can be had either rabbit-netted or with plain wires which make the gate sheep-proof.

CYCLONE FENCE AND GATE CATALOGUE SHOWING DESIGNS & SPECIFICATIONS—FREE

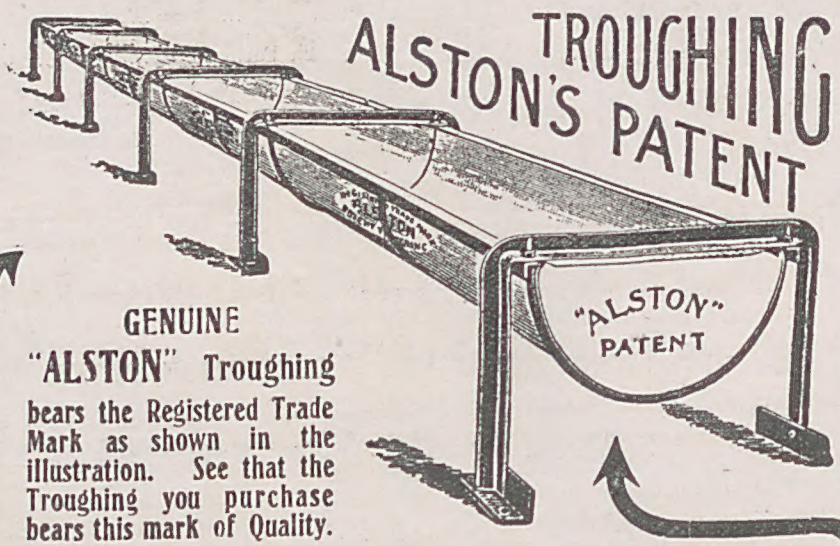
Cyclone Red Tag Quality Fence and Gate Products
Cyclone Fence & Gate Co Pty Ltd

STURDY & DURABLE

The superior quality of Cyclone Gates and Fences is the result of our 25 years' experience in making better gates and fences for Australian properties.

CYCLONE FENCE & GATE CO. PTY. LTD.
189-191 WILLIAM ST., MELBOURNE

ALSTON'S PATENT TROUGHING



GENUINE
"ALSTON" Troughing
bears the Registered Trade Mark as shown in the illustration. See that the Troughing you purchase bears this mark of Quality.

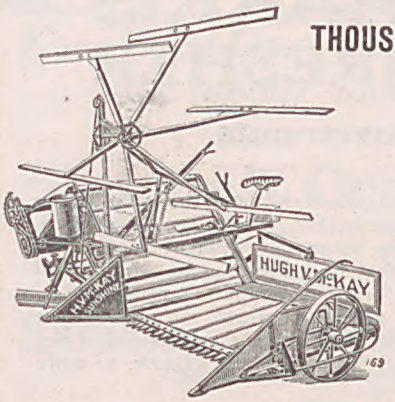
Steel throughout. Put together with a wrench, no solder required. Cannot leak or pull apart, because the Alston Patent Coupling makes a perfectly watertight joint, without grooves to fracture the galvanising, while locking every section together as rigidly as a bridge.

The heavy Steel Angle Frame and heavily Galvanised Steel Sheets used, together with our Patent Coupling, are points which make the "ALSTON" TROUGHING superior to all others.

Send for Illustrated Leaflet.

JAMES ALSTON & SONS PTY. LTD., Queens Bridge, Melbourne.
Postal District 6.

The Sunshine Reaper and Binder



THOUSANDS IN USE THROUGHOUT AUSTRALIA

Reliable. Durable.

CASH PRICES:

6 ft., £68; 8 ft., £90 10s.

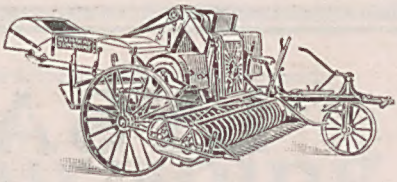
or extended terms on a liberal basis.
Delivery on trucks, Sunshine.

Efficient Expert and Duplicates Service.

WRITE FOR CATALOGUE.

The Sunshine Header Harvester

In the harvest of 1924-25, these machines **rescued** millions of bushels of wheat from down, tangled, and weed infested crops, which could **not** be harvested by any other method.



Write for catalogue, and list of improvements on the 1925-26 machine.

SUNSHINE QUALITY IS THE HIGHEST
SUNSHINE PRICES ARE THE LOWEST

Ask for Catalogue and Price List of all Sunshine Implements.

MENTION THIS PAPER.

H. V. McKAY Pty. Ltd.

Sunshine Harvester Works, Sunshine

Showrooms: 664 BOURKE STREET WEST, MELBOURNE
and at Brisbane, Sydney, Adelaide, Perth, Launceston

Progressive Farmers
should see the

MASSEY-HARRIS
REAPER-THRESHER

for latest improvements

The Massey-Harris Reaper-Thresher offered to farmers this year is the latest model, and has special improvements for Australian conditions, which are exclusively Massey-Harris. The numerous improvements have already met with approval, and it is manifest that these latest models will be a great success, greater even than the original Reaper-Threshers introduced by Massey Harris Company years ago, and which superseded the wasteful Stripper-Harvester. You should see this new Massey-Harris Reaper-Thresher before you buy. Call at the local Massey-Harris agency, or write for particulars.

Massey-Harris Co. Ltd.
570-576 Bourke St., Melbourne

Branches in All States
Agencies Everywhere

LYSAGHT'S
—— ORB ——
CORRUGATED ROOFING IRON

Full supplies throughout Australia are obtainable from all leading Storekeepers and Timber Merchants

AUDREY'S LORD TWYLIGH

The "Banyule" Jersey Stud

Heidelberg, Victoria——8 miles from G.P.O.

ALL GOVERNMENT TESTED
YOUNG STOCK FOR SALE

Inspection and Correspondence Welcomed.

C. GORDON LYON

TO ATTAIN

SUCCESS IN DAIRYING

Keep Good Cows and install efficient, reliable, and labour saving Dairy Machinery.

THERE IS NOTHING BETTER THAN

"Baltic" Cream Separators

World-renowned for clean skimming, easy running, and durability.
SEVERAL SIZES TO CHOOSE FROM.
REASONABLE PRICES. EASY TERMS. 30 DAYS' TRIAL.

Sanitary "Simplex" Milking Machines

They embody the very best scientific and successful methods for milking cows.

"CROSSLEY" (English) **Oil Engines** ECONOMICAL. EFFICIENT. Start instantly without trouble.

WRITE FOR FREE ILLUSTRATED CATALOGUE

For Separator Catalogue mention - - No. S 200
For Milking Machine Catalogue mention - No. M 200
For Engine Catalogue mention - - No. E 200

BALTIC SIMPLEX MACHINERY CO. Pty. Ltd.
491-493 FLINDERS LANE, MELBOURNE.

More Nourishing Feed—

RICH in Protein, POLLY DAIRY FEED is more nourishing than bran and pollard.

Animals thrive on it. Cows give greater milk yield when fed on it.

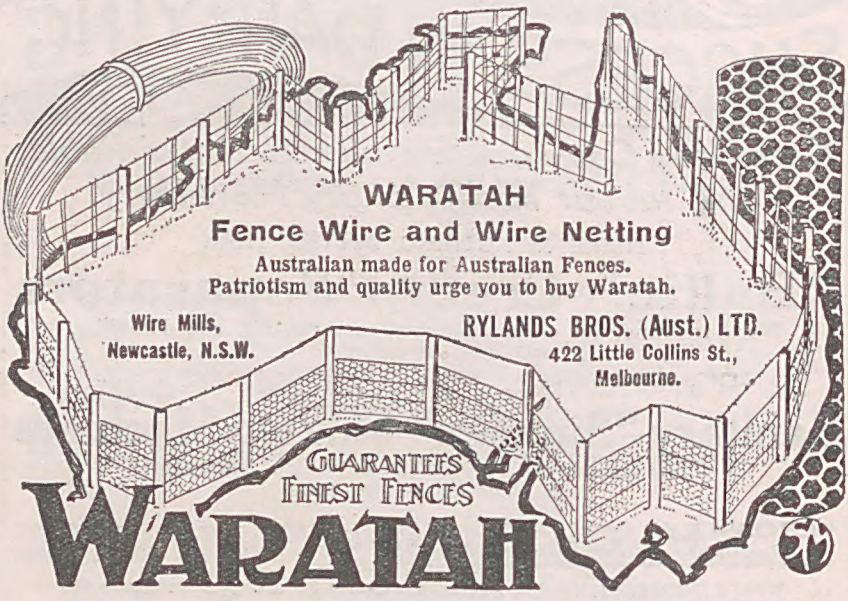
POLLY DAIRY FEED

A Pure Product of Maize.

Manufactured by

MAIZE PRODUCTS PTY. LTD.

FOOTSCRAY——————VICTORIA



THE

Farmers & Settlers' Co-Operative Insurance Co.

OF AUSTRALIA LIMITED

Farmers and Graziers, Support this Company with all your Insurances, when Dividends and Bonuses to yourselves will be increased considerably.

Full Particulars from any Agency of the Victorian Producers' Company, 360 COLLINS ST., MELBOURNE.

Scientifically Fitted

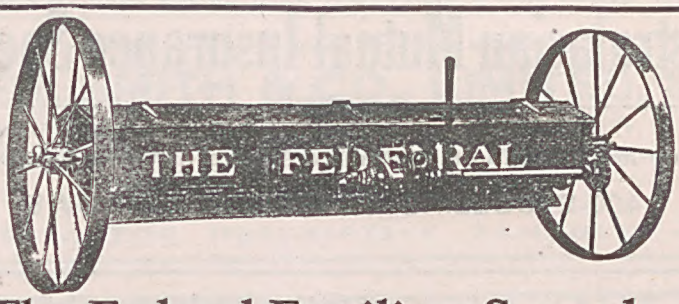
To Your Eyes & Personality

There is as much of an art in fitting glasses to harmonize with one's personality as there is in fitting the eyes correctly. Wood's Glasses combine the three essential features —Style, comfort, and quality.

'Phone 6778 for an appointment

E. WOOD PTY. LTD. 95 ELIZABETH STREET — MELBOURNE —

TOP-DRESSING IS PROFITABLE



The Federal Fertilizer Spreader

FOR

Enriching Pasture Lands to Increase the Stock Carrying Capacity

This Machine sows from 30 lbs. to 500 lbs. per acre. Provided with star feeds—cannot clog—sowing quantities easily and quickly changed.

A One-Horse Machine, and a Boy can operate it.

T. ROBINSON & Co. Pty. Ltd. Patentees and Manufacturers

Factory: Spottiswood, Vic. Show Rooms: Bourke St. Write for Catalogue.

PARSONS BROS. & CO.

Propy. Ltd.

OATMEAL, SPLIT PEAS, and
PEARL BARLEY MILLERS
and "CORNINA" MANUFACTURERS

ARE

BUYERS of OATS, PEAS, BARLEY, and MAIZE.

SEND SAMPLES OF YOUR GRAIN TO US.

BOX 2514.
G.P.O., MELBOURNE.

'PHONE 7419 CENTRAL

.. THE ..

Australasian Mutual Insurance Society

LIMITED

(Now Incorporated in the Australian Alliance Assurance Company.)

400-2 COLLINS STREET, MELBOURNE

LIVE STOCK INSURED

At Lowest Current Rates obtainable in Australia.

OTHER DEPARTMENTS OF BUSINESS

Fire, Marine, Fidelity Guarantee, Plate Glass, Personal Accident and Sickness, Employers' Liability, Workmen's Compensation, Public Risk, Motor Car, and Burglary.

INSURE WITH THIS SOCIETY, AND RECOMMEND IT TO YOUR NEIGHBOURS

COCKBILL'S HIGH-GRADE BLOOD AND BONE MANURE

HIGHEST ANALYSIS IMMEDIATE RESULTS

COCKBILL'S MEAT MEAL FOR POULTRY

Fills the Egg Basket **Price, 16/- per cwt.**
Poultry Bone Grit, 15/- per cwt. **Cattle Bone Lick, 16/- per cwt.**

Prices and Analyses of Manures on application to

J. COCKBILL, Manufacturer of High-Grade Manures

407 POST OFFICE PLACE, MELBOURNE **Telephone 2098**

BONES BOUGHT CONSIGN TO J. COCKBILL, FOOTSCRAY

16 Years Practical Tests

THOROUGH SPRAYING WITH "BLUE BELL" Arsenate of Lead

(Paste or Powder)

INSURES CLEAN FRUIT

Full particulars regarding analysis and prices from

F. W. PRELL & CO., 31 Queen Street, Melbourne

or Local Agent in any fruit-growing district

Australian "ESA" Bluestone

APPROXIMATE ANALYSIS 99·15% COPPER SULPHATE.

FOR SPRAYING, PICKLING, BATTERY PURPOSES, ETC.

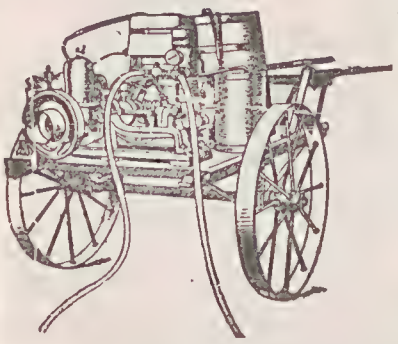
If your Storekeeper has no Stocks, Send your Inquiries to:—

ELDER, SMITH & CO., LIMITED, SOLE AGENTS

ADELAIDE: 27-31 Currie Street. MELBOURNE: 95-97 William Street. SYDNEY: 4 Bridge Street.

BRISBANE: 334-338 Queen Street. PERTH: St. George's Terrace.

—— WRITE FOR DESCRIPTIVE PAMPHLET ——



"BAVE-U"

Spraying Machinery

FOR ALL PURPOSES

Orchard, Vineyard, Station and Farm

RUSSELL & CO.

MANUFACTURERS

BOX HILL —— MELBOURNE

.. The ..

HONEY FLORA OF VICTORIA

By

F. R. BEUHNE

GOVERNMENT APICULTURIST

Price, 1s. 6d. - - Posted, 1s. 7d.

Obtainable from Department of Agriculture, Melbourne

NATIONAL TRUSTEES

Executors & Agency Company of Australasia Ltd.

DIRECTORS:

EDWARD FITZGERALD, Esq., LL.D., Chairman.
HENRY MADDEN, Esq. SENATOR BRIGADIER-GENERAL H. E. ELLIOTT, C.B., C.M.G., D.S.O., D.C.M.
GERALD P. NEWMAN, Esq. JOHN I. WINTER-IRVING, Esq.
CHAS. R. MURPHY, Esq.

This Company Acts as Executor or Joint Executor of Wills, Administrator, Trustee of Settlements, and Agent for Absentees under Power of Attorney.

MONEY TO LEND ON BROAD ACRES AND FARM LANDS

Offices—**113 Queen St.** (Corner of Little Collins-st.), **Melbourne**

J. H. MACOBOY, Manager.

TREWHELLA'S

MONKEY GRUBBER

is a simple arrangement that multiplies the power at the handle 260 times—handy to use, easy to move, quickly rigged, and works in roughest country. Standard equipment pulls trees and stumps from 1½ acres without changing anchor. Many other time and labour saving features. Catalogue with pleasure.

TREWHELLA BROS. Pty. Ltd., TRENTHAM

"Good Paint costs nothing"

You must ——— **PAINT or**
Your property must **PERISH**

So Buy the **BEST PAINT—**

FERRODOR

☞ *Ask your Storekeeper for it.*

Sole Distributors: WILLIAM ADAMS & COMPANY LTD.

521-3 COLLINS STREET, MELBOURNE
and all States.

A Shilling's worth of

Sulphate of Ammonia

is worth a Pound of Results.

Worked out to suit the average market garden acreage the quantity of

SULPHATE OF AMMONIA

required is relatively small indeed. Invariably the results are great—so great, in fact, that there is very little market gardening carried on without its aid.

"The result tells why Sulphate sells."

Literature from

METROPOLITAN GAS CO.

196 FLINDERS STREET ——— MELBOURNE

THE STATE SAVINGS BANK OF VICTORIA

CREDIT FONCIER LOANS

ON FARMS—

Up to two-thirds of valuation in sums from £50 to £2,000, repayable by instalments spread over a period of 26½ years. Interest 6½ per cent. per annum.

Special Terms for Discharged Soldiers and Dependants, also those who were in Red Cross and Transport Services, up to three-fourths of valuation, repayable by instalments spread over a period of 29 years. Interest 6¼ per cent.

NO CHARGE FOR MORTGAGE DEED

Application forms obtainable at any Branch of the State Savings Bank.

State Savings Bank,
Head Office—Elizabeth Street,
Melbourne.

GEO. E. EMERY,
General Manager.

Registered Trade Mark

Works—
CURDIE'S RIVER

Telephone—Central 2807

"BULLDOG" Unburnt (Ground Carbonate) Agricultural Lime

For Orchards, Crops, and Pastures

Its use is strongly recommended by all experts, and those who have had practical experience. Any quantity supplied at shortest notice.

For applying to land we recommend our "Ajax" Lime Spreader

Have you seen our Reinforced Cement Cattle and Pig Troughs?

Rates and full particulars from Distributors—

T. CURPHEY Pty. Ltd. 225 Coppin St. Richmond, Victoria

TASMANIA *for* Your Holidays

The Health Seekers' Sanatorium

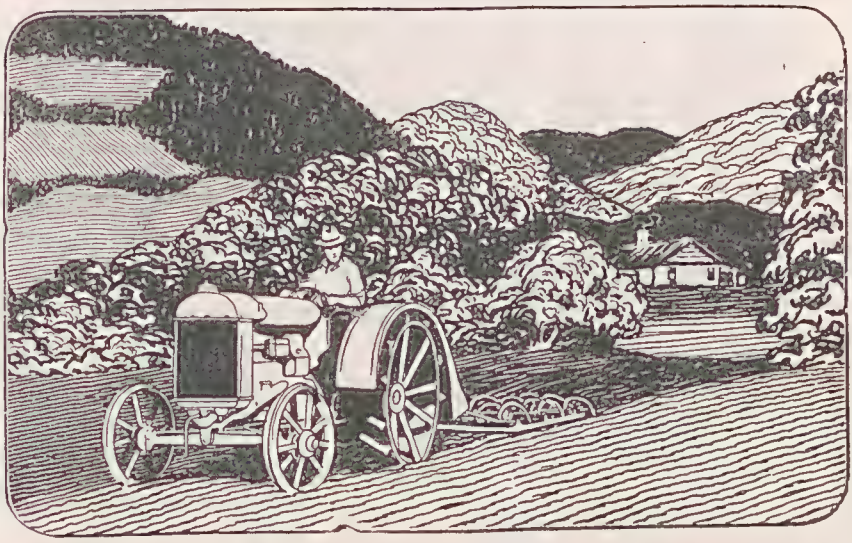
Delightful Pleasure Resorts. Superb Scenery—Mountain, Lake, and Coastal

First-class Accommodation. Moderate Charges.

We can arrange a fortnight's holiday, including fares and accommodation, for £25 2s. 6d. Particulars of various other tours supplied on application. Let us plan your holiday to suit your time and financial requirements

TASMANIAN GOVERNMENT TOURIST BUREAU

59 William Street, MELBOURNE



Fordson Speeds the Plough

With the Fordson ploughing is done in less time, furrows are proper depth, and seed beds are thoroughly well made.

The qualities of the Fordson are illustrated in the following letter from Mr. G. Mulcahy, of Pallamallawa, N.S.W., who says:—

"I used a Fordson to plough 500 acres and it easily and quickly works a 10-furrow plough, and, by a simple means of lighting, you can work late and early, which is so necessary in farming. During harvesting, it easily pulled an 8-foot Massey Header through a 40-bushel crop which was tangled by heavy rains and wind. I was using 12 horses in my other header. I will certainly use Fordson for all my farm work in future."

Not only does the Fordson enable the farmer to do the work at the right time, but it provides power for every farm need—universal service, which makes it indispensable.

Fordson Price, £180

Complete with Fenders and Pulley.

F.O.R. or F.O.B. at Ford Assembly Plant in each State.
Easy Terms of Payment can be arranged.

FORD MOTOR COMPANY OF AUSTRALIA PTY. LTD.
BRANCHES IN ALL STATES.

Fordson

THE UNIVERSAL TRACTOR

MADE BY ANY BUT FORD METHODS, THE FORDSON WOULD COST TWICE AS MUCH.

All Farm, Fruit, and Vegetable Crops, Grass Pastures, and Flowers

Require a full supply of NITROGEN.

NITRATE OF SODA

(The Best Nitrogenous Fertilizer)

will most effectively fill up the Nitrogen Deficiency.

To use Nitrate most economically and successfully, read—

"Nitrate of Soda: Its Production and Its Use in Agriculture"
"The Fruit Grower's Book of Manures"
"The Vegetable Grower's Manure Guide"
"Manures for the Small User"
"Top-dressing Pastures"
"The Use of Nitrate of Soda in the Home Garden"

Obtainable gratis on application and posted free from

THE CHILEAN NITRATE COMMITTEE

801 Culwulla Chambers, 67 Castlereagh Street,

G.P.O. Box 1197. — SYDNEY, N.S.W.

AUSTRALIAN MADE WIRE NETTING PROOF SYDNEY, N.S.W.

TRADE MARK

LYSAGHT'S

Australian Made

QUALITY GUARANTEED

WIRE NETTING

FENCING WIRE and other WIRE

ZINC OXIDE

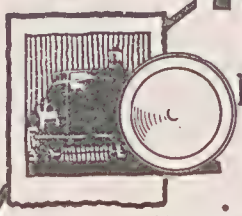
Obtainable from all the Leading Merchants and Storekeepers

LYSAGHT BROS. & CO. LTD.

Manufacturers — SYDNEY

Victorian Agents—Gibbs, Bright & Co., 34 Queen St., Melbourne

POWER at lowest cost



ONE of the outstanding characteristics of Cross Power Kerosene is its economy in use. Because it produces more energy per gallon, Cross enables tractors and oil engines to accomplish more work on less fuel.

Users of kerosene-driven engines throughout Australia and New Zealand are daily proving that it costs less to run their engines on

Cross POWER Kerosene

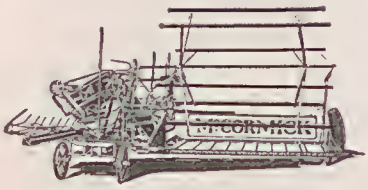
Sold by all Storekeepers

THE BRITISH IMPERIAL OIL CO. LTD. ALL STATES & NEW ZEALAND CK13

"Good equipment makes a good farmer better"

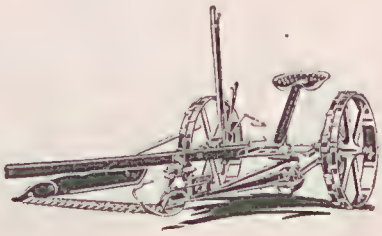
McCORMICK-DEERING FARM MACHINES

THERE is a machine to meet your every farming need at every season of the year in the McCormick-Deering line. No matter what size your farm—no matter what your problems may be, the most practicable solution of all your difficulties lies in standardizing on McCormick-Deering Farm Machines.



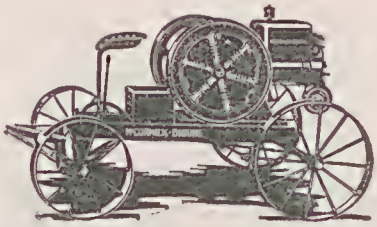
GRAIN BINDERS

For nearly one hundred years McCormick and Deering Binders have been identified with the farming industry. To-day they are established favourites with farmers in every part of the world. Made in 6 and 8-foot sizes.



MOWERS

McCormick and Deering Mowers cut clean. They are light in draft, easy to operate, and can be relied upon to give maximum efficiency in all fields. Made in 3½, 4½, 5, and 6-foot sizes.



KEROSENE ENGINES

The McCormick-Deering Engine will deliver sturdy, dependable power for all your jobs at minimum cost. Made in 1½, 3, 6, and 10 H.P. sizes. Fitted with removable cylinder, gravity-feed mixer, built-in magneto, throttle governor, &c.

FARM WAGGONS

The Sterling is a light but sturdy farm waggon built of carefully-selected, thoroughly-seasoned timber. Can be equipped with table top, brake, shafts, pole, neckyoke and trees, as required. All parts standardized.

International Harvester Company of Australia Pty. Ltd.

200 Roma Street BRISBANE 229-231 Castlereagh Street SYDNEY 543-555 Bourke Street MELBOURNE 113-114 North Terrace ADELAIDE

RICHARD PURSER & CO., BASSENDEAN, AGENTS FOR W.A.

NATIONAL MUSEUM OF VICTORIA

THE JOURNAL

OF THE

Department of Agriculture

OF

VICTORIA.

Vol. XXIII. October, 1925. Part 10.

PORT.*

By François de Castella, Government Viticulturist.

When honoured by the invitation to read a paper before this congress, Port suggested itself as an appropriate subject.

The Commonwealth bonus on sweet wines, and the tariff preference recently extended to us by the Mother Country, give us an opportunity such as we have never before enjoyed of developing an important export trade in sweet wines with Great Britain. Hitherto our shipments to London have been of dry wine only.

England is beginning to consume more wine. Her pre-war imports of 12,000,000 gallons have now increased to nearly 19,000,000; of this, some 10,000,000 gallons consists of sweet and fruity wines from the Peninsula. Surely it is but natural that "John Bull's Vineyard," to quote my good father nearly 40 years ago, should cater for at least part of this trade. The business should be kept in the family instead of going to outsiders, for there is no doubt whatever as to our ability to "deliver the goods."

It is probable that we will ultimately evolve a type, or types, of our own, distinctly Australian, and different from any of the world's well-known wines to-day—as has already happened in connexion with our shipments of dry red wine. Such is the history of wine-making in every country; an original is always better than a copy. Port is, however, the most popular wine in England to-day, and it may not prove unprofitable at the present juncture to examine the way it is made, and the main factors responsible for its peculiar character and excellence.

Port is so well known as to render description scarcely necessary. It is usually a red liqueur, or sweet wine, highly alcoholic, not deeply-coloured, and distinctly tawny, with a powerful balsamic and very fragrant bouquet, quite distinct from any other wine.

* Paper read at the sixth Inter-state Wine Congress, Rutherglen, September, 1925.

13882.

The gravity is between 1½ and 2 degrees Baumé; in other words, distinctly less sweet than our Australian sweet wines. This lesser sweetness is still further enhanced by a curious "dry finish" on the palate, a striking feature of a high-grade Port, which is distinct from the after-taste of most other sweet wines.

The alcohol strength is 37 to 38 per cent. proof. This applies to wines now shipped to England, and to Australia some years back.

The Ports which now enter the Commonwealth are made somewhat less alcoholic, in sympathy with our Customs Tariff, which penalizes wines of over 35 per cent. proof. They are usually just under this strength.

Port is certainly one of the world's most remarkable wines. Though little known and scarcely consumed at all in the Latin countries of Europe, it has attained wonderful popularity in England, with which country it is more identified than with its native Portugal. It seems to have filled a want in the cold English climate. It may, indeed, be said that Port has been made to the order of England, for the type, as known to-day, has evolved itself gradually to meet the English demand. According to Duarte de Oliveira, "If they (the English) have been the creators of Port wine, it is very true that it is they, also, who have changed, at its source, the nature of the wines of the Douro."

Since its revival about the middle of the eighteenth century, the Port wine trade has been almost entirely in the hands of English merchants. The extensive *armazems* or wine lodges they own at Villa Nova da Gaia, a suburb just across the river from Oporto, and the Factory House in Oporto itself, which for over 100 years has been the club of the wine trade, bear testimony to the hold acquired by English commerce over the Douro wine industry.

Nor must we forget the fact, whether it be to the credit of Port or a mere coincidence, that the most glorious days of Britain's history, those which saw the expansion of England into the vast British Empire, were the days of much Port drinking—when the "two-bottle man" was not ashamed of his capacity.

Poets have sung the praises of Port. George Meredith, among many writers, eloquently describes a venerable old wine. These are often quoted. Some Portuguese descriptions are also of interest. Duarte de Oliveira quotes Antonio Aguiar (who died in 1887)—

> Porto is the Koh-i-noor of fermented beverages, the wine which has carried the name of Portugal on wings of fame and made it known in the most distant latitudes of the terrestrial orb," and adds, "Indeed, of all liqueur wines which exist, not one approaches, even remotely, the type so distinct and unmistakable which is solely produced on the steep mountains fringing the great Douro river, commencing at Barca d'Alva and finishing at Regoa—the regions known as Alto Douro and Douro Superior." He again quotes Aguiar, "The wine of Porto is a king who does not fear the Republic, who heeds not the common people. He meets vassals wherever he may arrive. A king in the presence of real kings who do not dispute his sovereignty. Proud monarch that revolutions cannot depose, but is each day more firmly seated on his throne.
>
> "This is certainly true of Port," adds Duarte de Oliveira. "Let us hope he may always retain his sceptre, and that he may thus be eternally the king of wines."

A further quotation from the same author will show that the possibility of Australian competition has not been ignored in Portugal.

Writing of Bastardo in *Ampelographie* (Vol IV., page 215), he states that this sort should enter into the composition of the best Porto, since it has an average gravity of 15 deg. B.:—

It is with such sorts that liqueur wines were made that surprised the whole world. Wines envied by France, Italy, and Spain—which tried in vain to imitate these oenologic jewels. All countries can produce table wines of high value, but there is only the privileged region of the Upper Douro to give true Port."

In a footnote he quotes a letter from Mr. C. H. Rainford, then (1902) of the Queensland Agricultural Department, stating that at Roma, in dry years, Syrah yields musts of 15 and 15½ deg. B., whilst 14 deg. could be always relied on.

He comments in terms which may prove prophetic. In such circumstances, should climatic and geological conditions approach those which Portugal possesses in an infinitely small corner of the country, Australians will arrive at obtaining wines which may closely imitate Porto, especially if the choice of varieties is in accordance with what several centuries of practice has taught Portuguese viticulturists.

Evolution of Port.

Port, as we know it to-day, is absolutely different from the wine first shipped from Oporto to England in 1678. Since the initiation of the trade, the type of wine in demand has undergone numerous and radical changes.

Though, at first sight, there seems to be little connexion between wine and fish, the latter commodity is responsible for the start of the wine trade between England and Portugal. The Portuguese were great navigators. As far back as 1497 they established fisheries on the banks of Newfoundland. In 1578 there were 50 Portuguese ships engaged in the Newfoundland fisheries, whilst England had only 30.

Even before this, in 1353, the Portuguese fished for cod on the coasts of England. In addition to cod-fish, they carried wine, and exchanged both commodities against English manufactured articles. From such small beginnings the wine trade with Portugal was developed.

The first important shipments were not from Oporto, nor was the wine anything like Port. They consisted of dry red wines, somewhat similar to Burgundy, but more acid, grown in the northern province of Minho, and shipped from Vianna do Castello, some 40 miles north of Oporto.

These wines were what the Portuguese know as *vinho verde*—in English, "green" or "eager" wines. The latter term did not, as might be thought, refer to their brisk freshness, but is a corruption of the French word "*Aigre*," meaning "sour."

Prior to 1678, Vianna was the only port of shipment, and the wines exported were mainly of vinho verde type. It was about this time that the first shipments from Oporto were made. These were of Douro wines, which soon found favour in England, ultimately supplanting the Minho wines, with the result that, after a few years, shipments from Vianna ceased altogether.

For the year 1678 shipments from Oporto to England amounted to 408 pipes.

Fifteen years later (1693) they had increased to 13,000 pipes. After this there was a slight falling off; from 1694 to 1717, shipments fluctuated between 5,000 to 10,000 pipes annually, increasing to an average of 17,692 pipes for the ten-year period 1718-1727.

The celebrated Methuen Treaty was concluded in 1703. It was intended as a hit at France, and admitted Portuguese wines into England at £7 per pipe, whereas French wines paid £55. This Treaty is usually held responsible for the popularity of Port in England. Its immediate effect was not, however, very marked. It crippled the wine trade between England and France, and ultimately, some fifteen years later, statistics show increased imports from Portugal, which averaged 19,000 pipes a year from 1728 to 1737.

These heavy shipments led to the usual abuses; blending in of inferior wines and adulteration. Elderberries were largely used to increase the colour, too much reduced by the admixture of white grapes.

Fortification seems to have increased in degree about this time, and bitter complaints were made by growers as to the demands of the trade. In a circular letter dated 1754, they say that the English require that the wine should even exceed the limits assigned by nature, so that, instead of a beverage, it should become a potable fire for the brain; a burning powder for the palate; of the colour of writing ink; sweet as Brazil and aromatic as India. Port fell into disrepute, shipments were on a smaller scale, and great depression prevailed in the Port wine district.

The Portuguese Government interfered, and in 1757 the celebrated Marquez de Pombal prohibited the blending in of white grapes. By the same decree he ordered the eradication of all elder trees within 5 leagues of the Douro river. Elderberries were still obtained from other districts, until, in 1771, all elders in the provinces of Beira, Minho, and Tras-os-Montes were ordered to be eradicated. The use of elderberries ceased, and vine sorts with more colour were introduced in their place, notably Touriga and Souzao.

In 1756 the Marquez de Pombal formed the celebrated Oporto Wine Company—a privileged corporation or trade monopoly with dictatorial powers. The wine trade was much interfered with, the Port wine district, the zone within which "Factory wines" (for shipment to England) might be produced, was "delimited" in most arbitrary and erratic fashion.

Certificates, or *bilhetes,* were given for approved wines. The concern became a mass of corruption, and there was wholesale trafficking in these *bilhetes.* Pombal himself was one of the first to violate the law. He shipped wine from Oeiras, in Southern Portugal, as real Port wine. The company was abolished in 1833, but re-established ten years later with somewhat modified powers. The second Company was finally dissolved in 1853, since when the trade in Port has been free. The old Oporto Wine Company, it is true, still exists, but it is no longer a monopoly, and has no powers.

The early Douro wines, though fuller and softer than the wines of Minho, were very different from modern Port. They were natural wines, probably similar to several fuller-bodied wines of the South of France. If spirit was added to them at all, it was in small quantity.

About the middle of the eighteenth century heavier fortification was introduced, to the great displeasure of the growers, as we have seen.

The close of the century saw a considerable revival in the trade and general improvement in the wines shipped. Fashion seems for

a time at least, to have returned to wines of lighter type, though after 1820 the public taste veered once more to heavier wines. Duarte de Oliveira describes the numerous variations which fashion has rendered necessary in Port. He explains that—

from the origin of its exportation to the present day its typical character has not been constant. It has had to obey the impositions of the different importing markets, and the particular palate of the respective consumers, restlessly capricious, especially that of England, which was the first nation to proclaim its incontestable value, and even to become until recently, the principal market for Port wine, whence all other countries were supplied.

To this great Empire were exported the first pipes of Port, which, after a hazardous passage down the river Douro, were stored at Villa Nova da Gaia and slightly fortified with about 3 gallons of wine spirit per pipe before finding their way to the small ship which was to convey them to the thirsty British market.

Baron Forrester tells us that as early as 1795 the Douro wines were fortified, on an average with 4½ gallons of spirit per pipe, this being judged sufficient—some wines received even less than this.

In 1845, according to this authority, the wines classed as *Rico* (rich) were fortified with 20 to 25 gallons per pipe.

Baron Forrester strongly opposed the transformation of the primitive Douro type, holding that a Douro wine should be "a pure and perfectly fermented wine, vigorous and elegant to the palate, dry to the taste, and with an attractive bouquet. It is stimulant and digestive, and its sugar being completely transformed and converted into alcohol, little or no additional spirit is required for its preservation."

Prior to this, in 1844, Baron Forrester had referred to the fickle and capricious taste of the trade. "The qualities of Port wine which are most appreciated have varied, with the different epochs; at one time dry and astringent wines are in demand, at another full flavoured and smooth wines, at one period very delicate wines, at another full-bodied wines."

Baron Forrester then deals with the wines of the 1820 vintage. "All these wines were *naturally*—this being an exception to the general rule—big, sweet, and of full flavour."

Duarte de Oliveira comments on these remarks: "It is very evident that for the 1820 wines, with the above characteristics, oenological methods hitherto not generally applied were forced on the growers. The grapes, so rich in sugar, would not have given soft and sweet wines had not the hand of man, guided by art, intervened in its manufacture.

The mystery of the suspension of fermentation of must by means of anti-ferments, of which alcohol is one, was explained.

"Port of 1820 vintage had a colossal success, and it became necessary to maintain this type, preferred by the great mass of consumers." According to Baron Forrester, "The merchants, realizing the great demand for these wines, insisted on always obtaining them the same."

The change was vigorously opposed by the Douro vine-growers. A keen and protracted struggle ensued between the merchants of Villa Nova and the Douro wine-growers. The merchants wanted the growers to make their wines in such a way as to satisfy the demands of commerce. The growers opposed the early fortification of the wine, in other words, checking the fermentation by the addition of spirit. They asked for legislation prohibiting the addition of spirit earlier than the month of November (May with us), by which time fermentation would be nearly complete.

The trade won in the end, and growers found themselves compelled to supply the type of wine most acceptable to their overseas customers, a type that has not altered much since.

Thus was evolved Port as we know it to-day. There are, of course, different types and subtypes in addition to the two great subdivisions of Vintage Ports and Tawny Ports, of which more presently. Port

to-day is a fruity to sweet liqueur wine, showing a gravity of $1\frac{1}{2}°$ to 2° B., and fortified to about 37 per cent. or 38 per cent. proof.

In short, something totally different from the wines first shipped from Oporto in the seventeenth century.

The Port Wine District.

Time will only permit of the briefest description of the Douro Wine District, one of the most interesting regions imaginable. From Barca d' Alva, on the Spanish frontier, the Douro, or Golden River, follows a westerly course until it reaches the sea near Oporto.

Port is not grown near this town, which has given its name to the wine, though it is only the port whence it is shipped.

The Port wine district commences at Barqueiros, some 40 miles upstream from Oporto, and continues to the Spanish frontier at Barca d' Alva. It is subdivided into two sections, viz., the *Alto Douro*, extending from Barqueiros to the rapids known as the Cachão De Valleira, and *Douro Superior*, continuing thence to Barca d' Alva.

Formerly the Alto Douro alone was looked upon as the home of true Port. Regoa, its capital, and the smaller towns or large villages of Pinhao and Tua, were the centres whence, in the old days, the wine used to be sent down the river to Villa Nova in barges. Since the construction of the railway it is conveyed more safely by train.

To-day, the Douro Superior also contains vineyards yielding very choice wines, equal to those of the Alto Douro. The two sections are now known collectively as *O Paiz Vinhateiro do Douro* (the Douro wine country). The average wine yield of the region was, in 1900, considered to be just over 6,000,000 gallons, the area under vines being approximately 84,000 acres (on these terraced hillsides, areas are difficult to compute exactly).

The vine land consists of a fairly narrow band on either side of the Douro River, and also on those of such tributaries as the Corgo, Pinhão, and Tua, &c. It is limited in extent, for the Douro differs from most rivers in having little or no level land near its banks. The ground rises steadily, in steep, rocky slopes, to the tops of the hills at a height of often 1,000 feet above the river-bed. Its tributaries are, like it, shut in by steep hillsides rising abruptly from high-water level. The vines are cultivated on terraces, which, rising tier upon tier, give the district a characteristic appearance. Above a certain level (400 or 500 feet above the river) the quality of the wine seems to fall off, and vines are not now cultivated there, though in former times, when the Douro produced its own fortifying spirit, this was grown largely on the higher levels. There is an old Portuguese saying that no good wine is produced beyond where one can hear the creaking of the *espadellas*—the immense rudders which enable the barges to be steered over the numerous rapids of the Douro River.

On these strips, of varying width but usually fairly narrow, on either side of the river and its tributaries, are produced the wines which have made "Port" a household word throughout the English-speaking world. Formerly the whole of the lower hillsides were covered with vineyards. To-day the scene is a depressing one, as viewed from train or river. Though there are many fine vineyards, there are also

numerous gaps covered with scrub, growing over the crumbling terraces once occupied by prosperous vineyards. These testify to the ravages wrought by phylloxera. Many of the vineyards have been reconstituted, and the wine yield of the district is now nearly equal to that of pre-phylloxera days, but the area under vines is considerably less than it was.

Though the Port wine trade is mainly in the hands of the English merchants, the land which yields the wine is largely held by Portuguese owners. It is true that some of the *quintas,* or vineyards, have been purchased by English merchants, but only a small proportion of the whole.

For many years past the owners have contracted to sell their young wines to the merchants—sometimes for a series of years, but more usually for the coming vintage. The merchant supplies the fortifying spirit, which is sent up to the quinta before vintage. In many cases an agent is also sent to supervise the making of the wine, to see, among other things, that inferior grapes from occasional patches of rich land near the river or from adjacent granite formations are not blended in with the grapes of the quinta. In former days these contracts were curiously indefinite; no price was fixed for the wine, which was paid for according to its quality, when tasted at the first racking. The quinta owner trusted the merchant, who seems not to have abused the trust. This Arcadian system is largely giving place to more definite agreements, which should certainly be more satisfactory to all parties.

Climate and Soil.

The Port wine district is reputed to have an almost torrid climate, at least in England where one often hears of the parched and arid Douro hillsides and is apt to conclude that the climate is hot and dry. To a new arrival from England it may appear so in summer, but not to an Australian.

In comparison with Oporto, 50 miles away, it certainly is relatively dry, and, owing to the absence of much coastal cloud, warmer and more sunny.

Rainfall figures kept at Castedo—about the centre of the Alto Douro—from 1902 to 1912 show an average of 24 inches, varying from 17 inches in 1904 and 1908 to 32 inches in 1910. At Oporto the rainfall is about double these figures. In some years long spells of dry weather occur, for example, in 1907, when only 9.68 inches fell from 1st January to 30th September, and of this 2 inches fell in September, just in time to save the vintage. On the loose porous soil of these steep terraced hillsides such dry spells are severely felt.

Shade temperatures only occasionally exceed 100 deg. F., in August, the hottest month.

It will be seen that the climate of the Douro is neither so dry nor so warm as that of Rutherglen. Nor can the atmosphere be quite so dry if one may judge from the fogs which at certain seasons of the years are quite a feature of the Douro Valley.

The soil of the Alto Douro is of a very special nature, and exercises a potent influence on the wine. Geologically, the country rock is a soft schistose slate of Cambrian formation, easily broken up, and which quickly weathers into a fairly fertile, porous, sandy soil.

This rock is usually of a fibrous, silky, semi-crystalline texture, and often of a greenish colour. Some of the rock met at many places in the Rutherglen hills is quite similar in appearance to the Alto Douro schist, though harder and redder in colour.

The Rutherglen rock is Silurian, and therefore closely connected, geologically, with Cambrian, both being of primary age.

In Port, we have a striking example of the oft-noted fact that wines grown on slaty or schistose soils of primary age show a marked tendency to develop a rancio character and tawny colour. Akin to Port in this respect are the Grenache wines of the Priorato district of Spain, near Tarragona. Though not in the same class as the Douro Ports, they show a family resemblance to them, the two wines having in common the tawny colour and rancio character. In France, likewise, on the northern slope of the Pyrenees near the Spanish border, at Banyuls and Collioure, do we find Grenache grown on primary formation yielding wines of rancio type.

The connexion between primary schists and the true Port character is very conclusively shown in the Alto Druro. This privileged region is surrounded by granite country. The line of demarcation between the granite and the Cambrian is distinctly noticeable in the wines produced. No Port is ever grown on granite soil, but solely on Cambrian schist. On granite are grown table wines which have no tendency to develop a Port character.

Near the junction of the two formations small islands of granite occasionally occur, surrounded by Cambrian; these granitic islands yield table wines, but never Port.

The similarity of many Rutherglen soils to those of the Douro is further borne out by the wines produced. The excellence of many of our sweet wines here finds a logical explanation, and constitutes a happy augury for the future.

On these Douro hillsides, in their natural condition, the rock is often covered with but a thin layer of soil.

When the vineyard is established, subsoiling is practised to such a depth as to surprise an Australian visitor, 8 feet and over being not unusual, whilst it is seldom less than 5 or 6 feet. The operation suggests quarrying rather than ordinary vineyard preparation. Contour retaining walls or *géos* are built to support the terraces at intervals depending on the slope of the land. The soft rock is broken down with crowbars and picks into small pieces, which soon weather into soil. The resulting land is loose and friable, and drainage is perfect, in fact sometimes excessive, so that very deep plantation is often necessary in order that the vines may survive the first summer. On some vineyards resistant rootlings, 3 feet long and over, are planted. Field-grafting is the general rule. Cultivation, which is all done by hand, is very thorough, the first or winter working being executed to a depth of nearly a foot.

The vines are planted about 4 feet apart in the row, and the rows are from 6 to 8 feet apart. The distance apart is largely dependent on the width of the terraces, and this, in turn, depends on the slope of the ground. The vines are long pruned, one, two, and even three rods being left to a vine, according to its strength—usually a few spurs are left as well.

The Vine Sorts from which Port is Made.

Unlike Burgundy and Champagne, which are made from one grape alone, viz., Pinot, Port is a wine into the composition of which enter quite a number of distinct sorts. Fully a dozen are extensively grown on the Douro, and can claim to be the producers of the finest wines. Some of these predominate in one vineyard, and some in another, so that there is a good deal of variation in the wines yielded.

These are equalized by blending, and it is mainly owing to the skill with which this is carried out that the uniformity of high-class Port turned out by any of these well-known wine-houses is due.

Some of these vine sorts present striking features, and influence in a vital manner the character of the wine into the composition of which they enter. Others are more neutral; they might be termed basis or bulk sorts; although they enter in notable proportion into the composition of some of the finest Ports, they do not seem specially responsible for their quality.

Among the choicer of these sorts we find grapes filling very different functions. Some, like Grenache, show colour instability and a tendency to Rancio character. Others have greater stability of colour and prevent the wine from becoming altogether too pale. According as changes in fashion demanded a darker or lighter colour, so did one or another group become more popular with vineyard planters.

Among so many sorts, each with its peculiar value, it is difficult to say which are most important—in other words, to reduce to a more reasonable number the twelve sorts constantly met with. Nevertheless the three most important quality sorts seem to be Alvarelhão, Bastardo, and Touriga; closely following these are Tinta Cão, Donzellinho do Castello, Mourisco Preto, and Tinta Francisca. Souzão is mainly remarkable for its intense colour, whilst Cornifesto, Tinta Roriz, Tinta Carvalha, and Tinta Amerella are bulk or basis sorts.

To this list must be added the white varieties, Codega, Diagalves, Gouveio, Malvasia, &c., which yield white Ports, and the Muscats from which is made a sweet wine, very similar to our own Rutherglen Muscat.

One might expect to find, among the Douro varieties, one or more well-known vines under new names. This is so to a very limited extent. Grenache, for example, is grown in some parts of Portugal under the name of Aragonez or Tinta Aragoneza. It has been introduced to the Douro and planted in one or two quintas, but it is not at all largely grown, and plays no part in the wines of the region. No doubt Bastardo, and some other sorts which show instability of colour, take the place which Grenache does in other countries, in the Priorato district of Spain, for example.

Several French sorts have also been introduced and tried more or less extensively. Among these are Cabernet, Syra, and Alicante Bouschet. With the exception of the last-named, which has been planted as a colour variety in some quintas, though not extensively, these sorts are of small importance in the Douro vineyards.

Brief mention must be made of the Red Muscat grown on the Douro, as it is probably identical with our Brown Muscat. It is distinct from the French Muscat de Frontignan, and is known in France as *Muscat rouge de Madère* (Red Madeira Muscat). This and also

a white Muscat, which seems to be that of Frontignan, are grown to a certain extent in several Douro quintas. The grapes are vintaged separately, to make Muscat wines, which were mainly shipped to Brazil and formerly to Russia. Muscat grapes are never crushed with Port, at least, not nowadays, though in former times some of the Ports shipped to Russia had a small proportion of Muscat blended in. Such wines were never shipped to England.

Several of the leading Port grapes have been introduced into this State.

The writer imported from Portugal, in 1908, limited numbers of several of the above sorts, viz., Alvarelhão, Bastardo, Touriga, Donzellinho do Castello, Cornifesto, Tuita Carvalha, Tinta Roriz, and Tinta Amarella. To his regret, grafted rootlings of Tinta Cão, Mourisco Preto, and Souzão were not obtainable. The above sorts are still growing in the collection of the Viticultural Station.

The main importation of Port varieties was, however, that made in 1910 by Mr. Alec. Prentice from Richter's Nursery, Montpellier, France, through Mr. B. W. Bagenal. On the writer's advice four sorts were ordered, viz., Alvarelhão, Bastardo, Touriga, and Tinta Cão. Mr. Bagenal, who, about a year previously, was on his way to Europe, was commissioned to secure the necessary scions. After repeated endeavours, he failed to do so from the leading London wine merchants, whose Oporto representatives showed similar reluctance to part with any of their stock, as do South African ostrich farmers. In France he was more fortunate, Mr. Richter being eventually able to secure the desired scions, with the exception of Tinta Cão, through an ex-student of Montpellier College, then residing in Portugal. These scions were grafted in Richter's nurseries, and the resulting grafted rootlings were shipped in cool storage in 1910. In the three vines secured, which differ most widely from one another, are represented all the salient features that make a high grade Port. It is well to briefly outline here the leading characteristics of each of these.

Alvarelhão is responsible for one of the choicest qualities of a high grade Port; for that inimitable "dry finish" which distinguishes it from all other sweet or fruity wines. Although the wine is distinctly sweet when first tasted, it leaves a dry and absolutely clean impression on the palate, and in this it differs considerably from wines of Port type which have as yet been grown in Australia. There seems good reason to believe that the peculiar acidity or roughness attributed to this grape by Portuguese authorities is mainly responsible for this characteristic true Port.

According to Duarte de Oliveira—

> It certainly plays the principal part in the wines which have made the world-wide reputation of Port. In view of the exquisite delicacy of flavour it communicates, the wine-taster can immediately recognize it even if present in small proportion in a wine. It causes Port wine to age, since it favours oxidation; thus, a wine containing some Alvarelhão in its composition might at eight years old be easily mistaken for a wine of ten or twelve years.

The chief virtue of this grape seems to reside in a special acidity mainly contained in the skin, from which it is extracted by the system of wine-making peculiar to the Alto Douro, known as the Feitoria method, which consists in repeated trampling with the feet during fermentation in the vat, or lagar, as it is called on the Douro.

Without this repeated stirring, the acidity and bitterness contained in the skin of the Alvarelhão grape, so largely responsible for the leading characteristic of true Port, is not properly extracted and communicated to the wine.

Bastardo differs radically from the foregoing. It is an early ripening grape, thus yielding a higher gravity must than any of the other Port varieties. Its chief defect is a liability to sun scald in a very hot autumn. Even on the Douro it is, on this account, discarded on all very sunny aspects, and since reconstitution, it has played a less important part than it formerly did. And yet Bastardo seems to be responsible for many of the remarkable qualities of Port, more especially of the lighter-coloured type known as tawny port. The wine yielded by it, like that of Grenache, is remarkable for the instability of its colour and for rapidly developing the tawny or onion peel tint and rancio taste.

According to Duarte de Oliveirá—

The fermentation of this grape is exceedingly lazy, extraordinarily slow of accomplishment; even though the grapes be not over ripe, the must is always thick and viscous; it is necessary to wait several days and to stir frequently in order to bring the wine to 0 deg. B. for the making of a table wine. If made into Port the vat is racked at 5 or 6 deg. Baumé. Fermentation then proceeds quicker, because the most difficult stage is the reduction of the gravity from 5 deg. to 0 deg. B., especially when the original gravity was greater than 12 deg. or 13 deg. B. He expresses regret that this grape is rather neglected in present-day plantations, because "Bastardo" has been the great variety which has made the reputation of Port wine.

Figueirido (1875) states that Bastardo produces a generous wine only slightly astringent, remarkably aromatic, though little charged with colour. It requires very thorough trampling and long fermentation. In Beira Alta there are two varieties of this vine, which produce a balsamic and generous wine, which forms the best blend possible with Touriga and Alvarelhão.

Touriga is, to-day, the most popular choice variety on the Upper Douro. It differs considerably from the two preceding sorts. Alvarelhão yields a wine light in colour, whilst that possessed by Bastardo is lost at an early age. Touriga, on the other hand, yields a wine rich in colour of good stability.

Touriga was first largely planted when the suppression of the use of elderberries turned the attention of growers to sorts with more colour. Ports of darker colour were much in demand early last century, when it was the fashion to lay down vintage Ports.

Duarte de Oliveira looks upon Touriga as "A Port variety of the very first order. For its wine to possess all its quality, complete maturity of its fruit must be awaited; the wine is then very alcoholic, of rather light body, and of a brilliant red colour, darker than the famous Cabernet sauvignon than which it has more body and character."

To describe briefly the chief parts played by these three sorts we may say—Alvarelhão for the curious dry finish and general distinction; Bastardo for body, bouquet, and tawny character; Touriga for colour and quality generally. Port is not made from a single grape variety, but is a blend of the three sorts referred to above, together with a few which present in less marked degree the characteristics of one or other of the three typical vines. These last, though useful, are not essential for the making of Port.

Wine Making in the Alto Douro.

I had the good fortune to see part of the 1907 vintage at some of the most celebrated Douro quintas. From the notes made and from the valuable work of Pedro Bravo and Duarte de Oliveira, published in 1913, the following brief outline has been compiled:—

The degree of maturity at which the grapes are gathered is less than might be expected for a sweet wine. I was considerably surprised to see the choicest growths being vintaged at 11 and 12 deg. B. It is true that the 1907 vintage was not remarkable for quality. Owing to rain just before vintage, the gravity was lower than in an average season. I was told that in the previous vintage, which was quite a good one, the gravity was in the neighbourhood of 14 deg. B.

Port differs from the majority of sweet wines in that it is not made from over-ripe grapes, no extra ripening process is practised after picking, as at Jerez and Malaga. The grapes must be quite ripe, but they are seldom over-ripe. It is rare for the gravity to exceed, or even reach, 15 deg. B., except in the case of Bastardo. The other Douro sorts range below this. Very over-ripe grapes have an unfavorable influence on colour stability—an important point—especially for vintage ports. Rain at vintage is dreaded, as it is liable to cause the grapes to rot. Faulty, and especially mouldy, grapes yield an inferior wine, the colour of which gives much trouble.

The question of the removal of the stalks is one on which wine-makers do not agree. At one of the best vineyards I visited, all stalks were removed by means of a stemmer of French make. In another vineyard famed for the quality of its wine, the stalks were not removed at all, and in others varying proportions of stalks were taken out by means of long-toothed rakes and a large-meshed riddle.

The English manager of the quinta, where stemming was not practised, explained that the need, or otherwise, of this operation depended on various factors. "Circumstances alter cases, and each case must be treated on its merits. There is no hard-and-fast rule. Partial stemming seems to be most usual. As in the case of Burgundy, Hermitage, and some other choice wines, the stalks, in moderate proportion, play a useful part, contributing to the character and quality of the wine, though it may take longer to mature than if made from entirely stemmed grapes.

The Feitoria Method.

The Feitoria, or literally the factory method, is a striking feature of the making of Port, and seems to leave a marked influence on the resulting wine. It consists in subjecting the grapes during their fermentation in the vat, or lagar, to repeated and protracted trampling by gangs of bare-footed men. The necessity of such in connexion with Alvarelhao has already been referred to, but it is applied to all the sorts from which Port is made. The Feitoria method is, in fact, general on the Douro.

Fermentation takes place in a large shallow vat termed a lagar, built of granite slabs. Lagars vary in size, but are usually about 15 feet x 15 feet x 2 ft. 6 in. deep, holding enough grapes to yield about 18 pipes of wine, in other words, about 2,000 gallons.

The grapes, whether stemmed or not, are placed in the lagar, which may take a couple of days to fill. At one of the celebrated quintas I saw the first week of vintage. The first lagar took three days to fill; by this time only traces of fermentation were showing. The grapes were not crushed, beyond the breaking caused by partial stemming, which removed about three-fourths of the stalks. The vintage was a cold one, and fermentation was long in starting. Vats filled subsequently would start earlier, as would also happen in a warmer season, or with mechanically-stemmed and crushed grapes.

When fermentation is about to start, the first trampling, known as "breaking the lagar," is proceeded with. This is hard work, especially if the grapes were not stemmed. It is carried out by twenty or more men who, with bare feet and trousers rolled up well above the knees, trample or dance on the grapes for four hours, until they are reduced to a uniform pulp, filling the lagar to a depth of a little over the men's knees. Subsequent tramplings are carried out in spells of from four to six hours at a time, separated by intervals of rest of similar duration. This goes on for the whole of the time the grapes remain in the lagar, usually for two or three days after the "breaking" or first trampling.

It is held essential for quality that a considerable amount of "work," as this trampling is termed, should be put into each lagar. The exact amount demands careful judgment. It is not desirable that fermentation should be too active, as this would cause the wine to become dry too soon, and necessitate racking the lagar before it could receive what is considered a proper amount of work. No hard-and-fast rule can be laid down, but a lagar seldom receives less than 24 hours' work in intermittent spells. The importance of this protracted trampling has long been recognized. Baron de Roeda is responsible for the old saying that "Port wine cannot be made without the feet of the Gallego," in other words, of the Gallician labourers, who come for the vintage from Northern Spain.

Duarte de Oliveira admits the need for thorough stirring during fermentation, but holds that the work could be more cleanly executed by mechanical means than by trampling according to the Douro method.

The Opening of the Lagar.

In other words, the moment for its racking and for the checking of fermentation by the first addition of spirit is a matter of great importance to the resulting wine.

Opinions differ as to the exact moment at which this should take place. During my visit, I saw one wine being stopped at a gravity of 6 deg. B., whilst in other cases it was down to 3 deg., 2 deg., and even lower when the spirit was added. These wines of different degrees of sweetness are afterwards blended in the wine merchants' lodges, as may be required. The wine stopped at 6 deg. B. must have been an exceptional case required for blending purposes. The average is certainly much lower. As Duarte de Oliveira points out:—

> In order that the wine may be rich enough in sugar, it is fatally indispensable that its fermentation be suspended at a certain point, but it is necessary that this standard should not be too high, because, if it were, we should have mere syrups in lieu of delicately aromatic wines, with all the dowries of refinement

that each variety of grape should give them. In other words, one would obtain a product rich in sugar, but which could not contain the true essences which are solely obtainable as the result of fermentation.

This is a most delicate point of Douro wine-making, in order to obtain the type of wine which commerce demands, and, contrary to what certain persons think, we are of opinion that a lagar should never be opened before the hydrometer shows us a gravity inferior to 4 deg., or even 3 deg. Baumé even though recourse must be had, later on, to the help of Geropigas, from selected regions, to give the sweetness, which may happen to be lacking in our most delicate wines of the Alto Douro." He explains that the use of sugar is illegal, and recommends must concentrated in modern apparatus, and sums up as follows—"A must stopped at 6 deg. or 5 deg. Baumé can never be looked upon as wine, it being no more than a Geropiga, or at least a half Geropiga, lacking the characteristics which should constitute a wine from an oenological stand-point.

It may be explained that Portuguese Geropiga is never boiled, as is the concoction to which we give that name here; the latter has really much more similarity to the *Arrope* of Malaga. On the Douro, Geropiga is simply fortified Must. Though an article of commerce, its use is only occasional, and the quantity made is not considerable. Duarte de Oliveira explains that there are three varieties of it—*Geropiga Branca* (white), made with the must of white grapes; *Geropiga Loira* (yellow), made from black grapes which have undergone a commencement of fermentation in contact with the skins from which the juice has taken more or less colour; and *Geropiga Tinta,* no longer a natural product, since its deep colour is partly due to elderberries. The use of these last is, however, prohibited by recent legislation.

The actual racking of the lagar is a simple matter. The wine is run off, and the marc pressed in the usual way. The wine from the press is kept separate and considered to be inferior. Owing to the amount of trampling the grapes have received, the juice readily separates from the marc; the proportion of "press wine" is relatively very small. It is remarkable how small a press can deal with the marc from one of these large lagars.

Fortification.

Fortification usually comprises three distinct additions of spirit to the wine. At the first fortification, when the lagar is opened, enough of the spirit is added to stop fermentation and to bring the strength of the wine to 29 or 30 deg. (proof). A second addition is made when the wine is taken to Villa Nova de Gaia during the winter, and the third and usually the final one at the subsequent racking. It brings the strength to 37 or 38 deg. proof—the standard strength of Port at the time of my visit.

At one of the leading quintas, I assisted at the opening of a lagar and the first addition of spirit to the young wine. No test was made of its alcohol content, though, no doubt, a record was kept of the initial gravity when the grapes were crushed.

The new wine was run from the lagar, through a channel cut in the stone floor to the *tonnel,* or large storage cask, the adega where these tonnei are kept being on a lower level. The spirit was rolled in pipes to a convenient position alongside the stone channel. By means of a rubber syphon, the spirit was run directly into the stream of new wine. In this way, an effectual mixing of the two seems to be obtained.

The Fortifying Spirit.

The spirit used in fortifying is a matter of vital importance, and has a considerable bearing on the character and bouquet of the wine. On the best Douro vineyards a highly rectified, silent or neutral spirit is never used. The spirit with which Port is fortified is really a young brandy. It is mainly distilled in pot-stills at a relatively low strength, and it retains a good deal of flavour of the grape. Its strength is usually 37 deg. over-proof. A sample of very old fortifying spirit I tasted in one of the armazems had all the characteristics of brandy, if not of Cognac.

When one remembers the low initial gravity of the must and the high strength of the finished wine, it is evident that nearly one-half of the alcohol contained in Port consists of added spirit. The type of spirit used, and the fact that it is not silent spirit, are points of great interest. The flavour of this spirit (even when young this is quite pronounced) has, no doubt, much to do with the character of the finished wine. It is noteworthy that this special spirit is used only for high-class wines which take time to mature. It must be added to the wine a long time before the latter goes into consumption, else the taste of new spirit would be noticeable. For cheaper wines, which are to be consumed young, or for slightly increasing the strength of an old matured wine, should such prove necessary, highly rectified silent spirit is used.

The merchants of Oporto are most particular in selecting the fortifying spirit that is sent up the Douro to be added to the new wine. It would appear to be only second in importance to the grapes from which the wine is made. At one time this spirit was distilled in the Alto Douro district from grapes grown at too high an altitude to be fit to make Port. At the time of my visit, the spirit was obtained from Southern Portugal, mainly from the neighbourhood of Lisbon. This change was due to the Portuguese Government prohibiting the distillation of wine on the Douro. It had, some years previously, prohibited the shipment of wine from Lisbon to Oporto, a concession to the clamour of Douro wine-growers, who were alarmed at the re-consignment from Oporto of Lisbon-grown wine, under the name of Port. It was now the turn of Lisbon growers to complain. To placate them, the distillation of spirit was prohibited on the Douro, and growers in that region were compelled to secure their spirit from the South. In some quarters it is held that the Douro spirit was more delicate and possessed more bouquet than that grown near Lisbon. The samples of fortifying spirit I saw bore evidence of careful distillation, with generous elimination of foreshot and feints. They were, in fact, young brandies, very clean, and showing a good deal of character—no doubt rich in esters, but free from bad taste of any kind.

Subsequent Treatment.

The new wine is sent down, during the winter following the vintage, to the armazems or wine lodges of the merchants at Villa Nova da Gaia.

Here the wine is stored until fit for shipment. These large wine-maturing establishments are mainly owned by English merchants. In former years the new wine had a rather hazardous passage down the

river in barges; to-day it is conveyed more safely by rail. On its arrival at Villa Nova it is graded, wines of similar type are blended to an even sample in huge cuvas or vats. Some of those I saw had a capacity of 120 pipes (14,000 gallons). Wines of different types are kept separate and blended later, shortly before they are shipped.

Maturation takes place mainly in pipes, which are stacked in tiers in the armazems, often three and four high.

These pipes are kept full during the first couple of years and racked once or twice a year. The racking is carried out by means of large wooden buckets containing about 5 gallons each. This primitive method exposes the wine to extensive aeration, which assists maturation. Port, in common with other wines of rancio character, is sensitive to air, which modifies its colour to the familiar tawny hue.

The maturation of Port differs essentially from that of Sherry in that no living organism plays any part in its development. The wine is too highly fortified, from its early youth, for any such growth to be possible. It is true that in some armazems the maturation is conducted somewhat on the solera system as regards withdrawal of matured wine and its replacement by a younger wine, but this is not the general rule, and these modified soleras are essentially different from those which play so important a part in the rearing of Sherry. The casks in which the wine matures are, no doubt, of great importance. It is well known, in connexion with all wines of this type, that a young wine, placed in a cask which previously contained rancios, develops this character much more rapidly than it otherwise would.

The casks in which Port is matured have long been used for the same purpose; in many cases they are over a century old.

In most armazems, in addition to the tiers of venerable pipes, one meets with compartments containing large storage casks. In these are stored old wines which have reached a more advanced stage of maturation, and which would become too much "worn" if further stored in pipes. These old wines are of great value for blending with younger and more robust wines, a comparatively small addition communicates quality and bouquet in a remarkable degree.

Wines of different types, of different colour intensities and shades, are blended shortly before they are shipped—more particularly does this apply to wines of tawny type, which, to-day, constitute the bulk of the trade.

Vintage Ports and Tawny Ports.

These are the two classes into which Ports may be divided. Though made in much the same way at vintage time, they differ radically in their after treatment. Tawny Port is matured in wood until fit for consumption, whereas vintage Ports are bottled early (at two or three years old, as a rule), and matured for many years in bottle. The difference between the two is striking, and well known to connoisseurs of Port. A vintage wine, as its name indicates, is always the produce of a single vintage. It is only special vintages, whose quality is above the average, which are sold as vintage Port and laid down to await the many years of maturation in bottle needed to develop their quality. When bottled, and for the first few years afterwards, they are rough and too dark in colour to be pleasant, but when sufficiently developed

are a revelation. The wine is then of a bright ruby colour, quite distinct from the tawny type, with a deliciously fragrant bouquet, and a marked freedom from the "oak" taste of a tawny Port. The excess of colour has deposited itself on the glass of the bottle forming a hard and firmly adhering crust, so that the bottle may usually be shaken without any cloud being formed in the wine. After very lengthy storage this sediment detaches itself from the glass in fine flakes, which settle almost immediately. The "beeswing" stage has been reached. The "laying down" of vintage wines is going out of fashion nowadays. Life is too hectic for those who can afford it, to look fifteen or twenty years ahead, and modern houses are not always provided with suitable cellars. The modern householder prefers to purchase the tawny type as he requires it, ready matured from his wine merchant.

Tawny Port is a totally different wine, and is entirely matured in wood until fit for consumption. It is not the produce of one, but of a number of vintages, the blending of which, in order to keep up a constant and even quality of any particular proprietary brand, constitutes the chief art of the skilful Port wine merchant. For example, the well-known "Duke Port," of Offley, Forrester, and Co., has probably altered but little, if at all, since the days of the "Iron Duke." Far from deteriorating from the admixture of younger wine, a very old tawny wine gains by being "refreshed" in this way.

In tawny Port, a slight taste of the oak wood of the casks is noticeable, which is characteristic, in the same way that it is of old Cognac. The oak taste must not be too pronounced, in other words, the wine must not be "woody."

White Ports.

These are little known in England or in Australia. They are produced on a much reduced scale as compared with red Ports, and at the time of my visit were mainly shipped to Russia and Brazil. They are made from white grapes such as Gouveio (the local name for Verdeilho), Codega, Malvasis fina, &c. Though grown on the same vineyards and treated in the same way as the red wines, they differ very much from them in bouquet and character.

* * * * * * *

From the foregoing it will be seen that Port owes its remarkable character to the usual four factors which determine the type, in the case of all other wines, viz., climate, soil, vine variety, and method of treating the grapes.

The climate and soil play important parts, the usual influence of soils derived from primary schistose rock on the development of rancio character being very marked indeed.

The sorts grown are also of vital importance. Port is made from a partnership of varieties, each member of which contributes its quota to the final result.

As regards the wine-making method, two points stand out, viz., the marked amount of trampling of the grapes during fermentation provided by the Feitoria method, and the special type of spirit used in the fortification of the wine.

Each of these different points is of vital importance; the omission of any one of them would profoundly modify the resulting wine.

PIG FARMING.

By A. J. Gill, Senior Dairy Supervisor.

Good Results at Pakenham.

A good example of mixed farming, carried on with progressive methods, is to be seen at Mr. Thompson's farm at Pakenham. This place, which comprises 230 acres of light loamy soil, is situated about 5 miles from the railway station. It is subdivided into 28 paddocks, varying in size from 1 to 20 acres. The boundary fence is of post and rail, with rabbit-proof netting. Portion of the subdividing fences is similar; the rest is of plain wire with four bottom barbed wires.

The stock on the farm consists of a pure-bred Jersey herd, sheep, horses, and pigs. The chief source of revenue is derived from the pigs.

Young Pigs, Two Months Old, just about to be Weaned.

Several acres are cultivated, peas being grown for grain, which is used for fattening the pigs. Rape is grown for green stuff, and on it the sows and litters are grazed.

Mr. Thompson, besides having had a sound business training, has had experience in different branches of farming. He also spent several years on a sheep and cattle station in New South Wales. There he experimented with pigs on pasture, and was so impressed with the possibilities in this direction that he determined to make pig-breeding and fattening the main feature of his farm at Pakenham.

As the grazing of pigs was something new to the district, old residents were inclined to laugh at the idea. However, they soon saw that there was no cause for ridicule, and now for miles around a very keen interest is displayed in the working of the place, for people are awakening to the fact that pig-farming will pay handsomely if conducted on sound business lines.

On approaching the farm, what impresses the visitor is its general cleanness and neatness. It is an object lesson to those who always asso-

ciate pigs with filth and slush. From 30 to 40 breeding sows are kept, most of them being pure-bred Berkshires; others are of Tamworth-Berkshire cross. Three pure-bred boars are used—a large Yorkshire, a Tamworth, and a Berkshire.

The sows are fed chiefly on pasture, and are maintained in a good forward store condition. If the pasture becomes scarce, and the sows show signs of falling off, a little grain is thrown to them. For some weeks prior to the time of writing, they had been receiving the wind-fall apples from a neighbouring orchard, and though there was very little grass the sows were in nice order. They were never allowed to get low in condition, nor to become too fat.

Before farrowing, the sows are brought into small paddocks close to the homestead, where they can be carefully watched. After farrowing,

Large York Boar.

they receive gristed grain, rice meal, and a little powdered skim-milk or butter-milk.

The young pigs are weaned at eight weeks, never earlier. Small self-feeders are placed in the paddocks, and fenced round with hurdles, each having an opening sufficiently large to admit the young pigs, but so small as to prevent the sows from entering. The suckers thus learn to feed from the automatic feeders before they leave their mothers. If it is available, the sows and litters are given access to rape or other greenstuff.

When ready to wean, the young pigs, with their mothers, are moved into the fattening paddocks. After two or three days, when the young pigs have become accustomed to their new surroundings, the sows are taken away. For the first few days after weaning, they receive the same varieties of food as had been given to the sow. They are then put on grains, which are fed, gristed or whole, dry, through automatic feeders.

Two types of self-feeders are used. One is of circular metal, the other is wooden, and oblong in shape. The first circular metal feeder used was imported from England, and others have been made locally on the same principle. The trough is divided into compartments, each covered with a lid or flap. The pigs quickly learn to lift the flap in order to get food. When the pig finishes eating, the flap falls back into place, thus preventing birds from taking the food, and also protecting it from the weather. On moonlight nights the flaps can be heard falling till after midnight.

All the pigs reared are fattened and sold as porkers. Very little labour or trouble is involved. A few seconds suffice to fill the feeders in the morning, or every other morning, as the case may be. The pigs balance their ration with the pasture, and usually grow and fatten

Shelter for Pigs.
(This shelter can be moved about as desired.)

rapidly. There is a good supply of running water in each paddock for them.

Experiments carried out on this farm show that young pigs do best when run in small herds, the most suitable number being from twelve to fifteen, and the handiest size for the paddocks from 1½ to 2 acres.

Results of Experiments in Cost of Feeding, &c.

Mr. Thompson very kindly arranged to weigh some of the litters, and keep a record of the food used, so that an accurate account of costs and profits might be obtained for the Department of Agriculture. Mr. A. Snodgrass, the local dairy supervisor, assisted in selecting and weighing the pigs. In order that the trial should be a fair one, the whole litters

were included from sows that farrowed at the same time. One litter of eleven pigs from a Berkshire sow by the large Yorkshire boar was placed in a paddock of 1½ acres, and eighteen young pigs from Tamworth-Berkshire crossbred sows by a Berkshire boar were put in a paddock of 2 acres. The ration consisted of gristed hulled oats, pollard, linseed meal, and meat meal. Oats, being the cheapest grain obtainable at the time, was chosen to form the bulk of the ration, which was fed in the following proportion:—4 lb. of oats, 2 lb. of pollard, ½ lb. of linseed meal, ½ lb. of meat meal.

Mr. Thompson secured a line of hulled oats at 3s. 6d. per bushel, pollard at £7 a ton, linseed meal at £10 a ton, and meat meal at £16 a ton. These prices are an object lesson to the farmers who usually buy their concentrates in small quantities at the highest prices ruling. By co-operating when purchasing concentrates, they would be enabled not only to obtain their supplies at the lowest rates, but would also effect a saving in freight.

The young pigs used for the test were weaned at eight weeks, and then weighed and numbered by tags in their ears. The results from the pen of eleven are shown in Table I.

Table I.—Showing Increase in Weight during a Period of Ninety-two Days of each of a Litter of Eleven Pigs from a Berkshire Sow by a Large Yorkshire Boar.

Dates	20th March.	20th June.	
Age	56 Days.	148 days.	Dressed Weight.
Number.	Live Weight.	Live Weight.	
52	32	128*	87
53	30	130*	92
54	26	134*	93
55	27	143*	96
56	20	100	67
57	21	87	55
58	28	144*	98
59	20	116	78
60	22	114	78
61	20	115	78
62	27	107	73
Total Weight ..	273	1,318	895
Average Weight ..	$24\frac{9}{11}$	$119\frac{9}{11}$	$81\frac{4}{11}$

The pigs marked * were too heavy for porkers and too light for baconers. They realized 8½d. per lb.. Others were sold at 9d. per lb. The return from the whole pen was:—

466 lb. at 8½d. per lb.	£16	10	1
429 lb. at 9d. per lb.	16	1	9
Total	£32	11	10

The great difference between the live and the dressed weight is very striking. This, however, can be explained by the animals having lost weight when travelling to the factory, and also by their having been a considerable time without food prior to being slaughtered. Figures supplied by the factory show that, in some cases, the loss in live weight amounted to 5 lb., in others it was as much as 11 lb.

One very noticeable point is that the extra 37 lb. of the heavier five pigs made a difference of only 8s. 4d. in the total return, approximately 2¾d. per lb. This brings out the fact plainly that it does not pay to make porkers overweight.

So as not to change the food suddenly, the practice of giving the young pigs for a few days the same kind of food as had been fed to their mothers was adhered to. Rice meal and dried milk were fed for the first day or two; then the mixture for fattening was introduced and continued till the pigs were sent to market. During the whole of the fattening period they grazed on 1½ acres. The total amount of the different foods fed, and the cost thereof is shown in Table II.

Table II.—Showing Quantity and Cost of Feed fed to Litter of Eleven Pigs during Fattening Period.

Lbs. of Food.	Description.	Price.	Cost.
lb.			£ s. d.
49½ ..	Rice Meal	1s. 9d. per bushel	0 4 4
11 ..	Dried Milk ..	27s. 6d. per cwt.	0 2 8½
1,745 ..	Hulled Oats ..	3s. 6d. per bushel	7 12 8½
991 ..	Pollard	£7 per ton (short ton) ..	3 9 4½
278 ..	Linseed Meal ..	£10 per ton (short ton) ..	1 7 10
209½ ..	Meat Meal	£16 per ton (long ton) ..	1 9 11½
3,284 ..	.. .. ..	.. ..	14 6 11

Cost of pigs at 8 weeks, 10s. per head	£5 10 0
Pasture—11 pigs, 12 weeks 2 days at 4d. per head per week	2 5 0
Cost of feed	14 6 11
Total cost	£22 1 11
Value of Pigs	£32 11 10
Cost	22 1 11
Profit	£10 9 11

Total amount of food used, 3,284 lb.
Total gain, live weight, 1,045 lb.

This shows a gain of 1 lb. live weight for every 3.142 lb. of food consumed in conjunction with pasture.

Gain, 1,045 lb. in 86 days; average individual gain, 1.105 lb. per day.

Table III.—Showing Increase in Weight during a Period of Eighty-six Days of each of Eighteen Young Pigs from Tamworth-Berkshire Cross-bred Sows by a Berkshire Boar.

Dates	21st March.	15th June.	
Age	56 Days.	142 days.	Dressed Weight.
Number.	Live Weight.	Live Weight.	
212	27	87	57
213	34	123	86
214	30	111	75
215	34	130	91
216	32	97	62
218	27	99	66
219	27·5	101	68
220	30·5	110	74
221	25	115	78
223	22	99	66
224	21	120	80
227	22	102	69
228	26	109	75
229	21	70*	43
230	25	92	61
231	20·5	71*	44
232	19·5	84	50
234	21	84	54
Total Weight ...	465	1,805	1,199
Average Weight ..	$25\frac{5}{6}$	$100\frac{5}{18}$	$66\frac{11}{18}$

Those marked * were too small to send to market, and the dressed weights given in these two cases are approximate.

The manager of the Dandenong Bacon Factory reported that these porkers were of nice quality. They realized the top price—9d. per lb.

Pigs, Three Months Old and a Month after Weaning, at Self-feeder.

TABLE IV.—SHOWING QUANTITY AND COST OF FEED FED TO EIGHTEEN PIGS SPECIFIED IN TABLE III. DURING FATTENING PERIOD.

Lbs.	Description.	Price Paid.	Cost.
lb.			£ s. d.
51½ ..	Rice Meal	1s. 9d. per bushel	0 4 6
16 ..	Dried Milk ..	27s. 6d. per cwt.	0 3 11½
2,399 ..	Hulled Oats ..	3s. 6d. per bushel	10 9 11
1,418½ ..	Pollard	£7 per ton (short ton) ..	4 19 3½
347 ..	Linseed Meal ..	£10 per ton (short ton) ..	1 14 8½
277 ..	Meat Meal	£16 per ton (long ton) ..	1 19 7
4,509 ..	.. .. ..	.. ..	19 11 11½

Pasture—3½d. per pig a week for 12 weeks 2 days	£3 4 6
Cost of rearing weaners, 10s. per head ..	9 0 0
Cost of concentrates	19 11 11½
Total	£31 16 5½
Value of pork (1,199 lb.) at 9d. per lb. ..	£44 19 3
Cost	31 16 5½
Profit	£13 2 9½

In this case, as eighteen pigs were grazed on 2 acres, 3½d. per week per pig was charged for pasture.

For the eleven pigs on 1½ acres, 4d. per pig a week was allowed.

The amount of food required for each 1 lb. of grain, live weight, was 3.363 lb. The total amount consumed was 4,509 lb., and the total gain in weight during the fattening period was 1,340 lb.

Average gain in live weight per day—.865 lb.

The eleven pigs running on 1½ acres showed a profit of £10 9s. 11d.

The eighteen pigs running on 2 acres showed a profit of £13 2s. 9½d.

Thus twenty-nine pigs running on 3½ acres showed a total profit of £23 12s. 8½d. in less than three months.

The results obtained are satisfactory, when the fact that the pasture on which they were run is not by any means first class is taken into consideration. They certainly indicate that there are wonderful opportunities for pig-farming in Victoria, and Mr. Thompson is very emphatic when he speaks of pigs as the best paying animals on the farm.

Further experiments with other grain will be carried out later.

Remarkable changes have taken place in the methods of handling and feeding pigs during the last few years. At one time they were the worst fed and most ill-cared for animals on the farm. For pigs kept in filthy styes, and fed from dirty troughs, it took 7 or 8 lb. of grain or more to make 1 lb. of pork live weight. Now by keeping pigs on pasture from 3 to 3½ lb. grain will show a gain of 1 lb. of pork. In the open pigs are healthy, feed well, and make gain quickly at a low cost. Green feed is exceedingly beneficial, and where it is not possible to graze the

pigs, green stuff should be fed in the yards. If only 1 lb. a day can be given a good effect will be noticeable.

The pasturing of pigs, or open-air pig keeping, as it is called in England, where it is being carried out extensively, promises to revolutionize the industry by cutting the cost of production down by about 50 per cent. The pig is now claiming a prominent place amongst the farm animals. The wheat-grower, the orchardist, and the dairy farmer are recognizing its value. Properly fed and carefully treated, it is doubtful if any other stock can give an equally good return; and it can certainly turn a larger variety of foods into money than any other farm animal in existence.

Another Type of Automatic Feeder.

PIG CLUBS.

In order to train boys and girls in the management of pigs, the formation of clubs will be found of great value, and while teaching the children, they will prove also instructive to adults. Hereunder are suggestions for rules and regulations for the formation of pig clubs, which, when possible, should be conducted under the auspices of the local Agricultural Society.

Objects.

The object of the club is to instruct boys and girls in the care and management of pigs, and how to judge and prepare them for the show ring.

To improve the methods of handling and feeding so as to make pig-raising profitable to the highest degree.

To bring about an improvement in the class of pigs in the district.

To develop a healthy community spirit and upright characters among the members of the club.

Rules.

Any girl or boy between the ages of ten and eighteen to be eligible to become a member.

Entrance fee to be, say, 2s. 6d., to cover the cost of membership ticket, on which a suitable motto should be printed.

Every member must carry out the instructions of the club leader as far as possible.

A careful record of food consumed by competing pigs, and the number of hours they are allowed on pasture must be kept.

The pigs must be weighed weekly if possible, and not less than once a month. For this purpose the club leader will visit the homes of the owners of competing pigs, and will make any suggestions he

Wooden Automatic Feeder.

thinks necessary regarding the feeding and housing of any pig. All weights and dates of weighing must be recorded.

A club picnic or show could be held at least once a year, when all pigs could be exhibited and judged. Records of the varieties and quantities of food fed to each competitor should be shown, together with a record of its weight at each periodical weighing.

The pigs should be judged by a competent person, who will take into consideration the individuality of the pig, its actual gain in weight, the cost of the food, the manner in which the pig is handled, and the neatness and exactness of the record. Prizes should be awarded.

Judging competitions might be held between the members of the club. Arrangements could be made, perhaps, for the judge to give a lecture and demonstration on judging after awarding the prize.

Two branches might be formed—the young sow branch, which, on the year following, would develop into the sow and litter branch; and

the feeding and fattening, or barrow branch, in which the pigs would be fattened, exhibited, and sold.

For the sow or gilt branch, breeders could be asked to supply pure-bred weaners for the club. Members should agree to have the young sows, when ready to breed, served by a herd-book boar. Further, they should undertake to return to the donor of the sow a young pig from the first litter, together with 6 per cent. interest on the value of the sow presented.

For the barrow fattening contest, weaners would be supplied to the members, who would not be required to make payment until the pigs had been sold.

All pigs would have to be weighed on delivery, and marked.

Monthly meetings of members should be held, at which papers could be read, and lectures given. These occasionally might be varied by musical evenings and games.

A committee of residents of the district could be appointed to carry out the work of the club.

A club leader would have to be appointed. His duties would be to organize the club, and to visit each member periodically, and give advice as to feeding and management.

Parents of members would have to pay cost of delivery of young pigs when such cost was unavoidable.

In the barrow competition, members might have up to three pigs each.

The committee's ruling on any subject would, of course, have to be accepted as final.

Ten members shall be the minimum number for a club.

If possible, pigs of the one breed should be chosen for the sow and gilt branch.

Cross-bred or pure pigs could be used in the barrow competition.

COLD STORAGE OF PEARS *

RESULTS OF EXPERIMENTS.

By J. E. Harrison, B. Ag.Sc., Department of Agriculture, Victoria.

The experiments in the cold storage of pears carried out in this country can be divided chiefly into three classes—

(*a*) Temperature tests.
(*b*) Maturity tests.
(*c*) Variety tests.

The same may be said of experiments in other countries, though in England a little work has also been done by Luthra on the influence of humidity. Mention of this will be made later.

In America, the question of pollination, too, has not passed unnoticed, and some interesting observations on this point have been recorded. The results of all temperature tests appear to be well known, but are very difficult of application in large holds and chambers. In

* Paper read at the Annual Congress of the Fruitgrowers Cool Stores Association of Victoria.

fact, one can safely say that the control of temperature is by no means efficient, and is open to considerable improvement. Many of our storage losses, both in pears and apples, would appear, too, still to be due to unsuitable temperatures. When we can control temperatures better throughout holds and chambers, we shall have gone a long way towards minimizing losses in storage.

American Experiments.

As our own experiments in pear storage have been limited to the last few years, a summary is given of the conclusions of American investigators, particularly those of Overholser and Latimer, of the University of California. A temperature of 30° F. has been found to give best results with pears picked at a proper stage of maturity. Commercial cold storage men, however, have hesitated to employ a temperature of 30° F., owing to the fact that, with the difficulty of closely regulating the temperature uniformly throughout large rooms, the range for temperature fluctuations is limited. From this view-point, a temperature of 32° F. has been found most satisfactory. It has been noted that *immature* pears keep better at 36° than at either 30° or 32° F. This proved true with the varieties Howell, Vicar, and Bosc.

As regards the stage of maturity at which to pick for best results in storage, most investigators have concluded that the general fault in America is to pick too green, and that the result is the fruit tends to rot at the core. By leaving the fruit on the tree two weeks longer than is practised for commercial picking, the life of the Bartlett pear in storage has been extended by six or seven weeks.

The most definite recommendation in regard to the Bartlett is given by Magness, who is very emphatic about the importance of maturity. He says, "If the highest quality is to be secured, pears for canning should not be removed from the tree until they show a pronounced yellow colour. If fruit is to be held in cold storage, it should be allowed to come to the stage recommended for cannery picking before removing it from the tree. Early-picked fruit has a marked tendency to scald in cold storage." This stage is more advanced than we ourselves advise, but I quote this American recommendation, as it supports our own experience against picking pears in an immature condition. It has been found, also, by Overholser and Latimer that the loss in weight during a ripening period of 20 days is greater in green fruit than in fruit just mature. It would appear, then, that a grower will reap a double advantage by delaying the harvest—he will have less loss through scald and core rot, and less loss in weight during ripening.

Varieties found most susceptible to scald or browning of the skin have been Bartlett, Louise, Bonne de Jersey, Beurre Clairgeau, Duchesse de Bordeaux, Vicar of Winkfield, Pound, Beurre Hardy. The varieties which have exhibited considerable resistance to the development of scald are Easter Beurre, Forelle, P. Barry, and Beurre d'Anjou.

Overholser and Latimer found that cross-pollinated Bartlett pears matured earlier than self-pollinated specimens, and this occasionally indirectly affected the keeping quality. They state that apparently cross-pollinated pears are ready for picking about two weeks earlier than self-pollinated ones.

The effect of climate has been investigated to some extent by Wagness, who found a wide variation in the length of time the fruit from different districts held up in storage. "In general," he says, "the districts with relatively high temperatures and low humidity during the growing season produce Bartlett pears with the best carrying and keeping qualities," i.e., the best fruit for storage is grown in hot, dry districts. He points out that observations indicate that the same holds good for many other deciduous fruits, though not necessarily in the same degree as with Bartlett pears. To quote his own words, "Plums, prunes, cherries, apricots, and other fruits seem to show a similar tendency toward poor-keeping quality when grown under particularly cool conditions."

This bears out our own Victorian experience, and though the subject has not been investigated in detail, it is becoming recognized that fruit from one district varies in its keeping quality from fruit of another district. If climate is such an important factor, then growers in the cool moist districts will need to watch the seasons, because they cannot store with the same safety in a wet season as in one mild or relatively dry.

As regards humidity, Luthra (England) kept pears in moist air and in dry air, and found that in dry air there was greater loss of weight, accompanied by wilting and earlier break-down. In moist air, on the other hand, the pears maintained a healthy greenish-yellow colour, and kept much better. No experiments were made, however, with varying percentages of humidity.

Results of Experiments made by Victorian Department of Agriculture.

Victorian experiments made so far confirm in the main the results of American tests. We have found that some varieties are more susceptible than others to blackening of the skin—Keiffer and Williams Bon Chretien being particularly so. With both these varieties blackening has been worse at 34° and 37° than at 32°. As far as maturity is concerned, it has not been conclusively shown that green fruit and yellow fruit both blacken more in storage than that just on the turn, but it appears fairly definite that Williams pears at the green stage blacken earlier and worse than fruit just turning.

The effect of temperature upon mould development has been shown to be definitely less at 32° than at either 34° and 37°. The investigation of core-rot has not met with success, but it appears to be a natural break-down, to which some varieties are more subject than are others. For instance, it is well known that the Jargonelle may develop core-rot on the tree. Winter Coles are very susceptible to the disease in storage, and pears from young trees of most varieties usually break down readily.

Hereunder is a summary of the results, hitherto unpublished, of a maturity and temperature test with Williams Bon Chretien pears.

The tests involved two consignments—the first lot was sent on 18th February and the second on 25th February. The fruit of the first consignment was not so mature as that of the second, which was in a marketable condition, being fully grown, but still firm and greenish in colour.

Each consignment consisted of three trays, and on arrival at the cool stores, one tray was stored at 32°, one at 34°, and the third at 37°.

On various dates a row of fruit was removed from each tray, allowed to ripen at room temperatures, and then examined for colour, flavour, and texture.

If we first examine the results as influenced by maturity, we find that on 9th April (eight weeks' storage) there was little difference between the fruit of the two consignments. After ripening, however, that of the second picking was somewhat better in flavour than the first.

On 23rd April, after ten weeks' storage, an examination showed that the fruit of the first picking, stored at three different temperatures, had all commenced to wilt, and that the pears were rather tart to the taste. Those of the second picking were superior, having a better taste, and not being wilted.

On 9th and 28th May, the same difference in flavour and texture was again apparent in all sound fruit, those of the second picking being distinctly superior.

As far as blackening was concerned, it appeared to take longer to develop in the second picking, but eventually to develop to the same extent in both lots.

If we next examine the results as influenced by temperature, we find that, even after eight weeks' storage, the fruit at 32° gave the best results, and that, as time went on, the pears kept at the lowest temperature showed more and more to advantage. Blackening appears simply to be delayed by low temperatures, but eventually to develop to the same extent as at high temperatures, unless the fruit first succumbs to mould or some other agency.

A survey of the above results for each consignment suggests the later picking and the lowest temperature as factors that enhanced the keeping quality of the pears. The fruit picked early commenced to show wilting after from nine to ten weeks in storage, and such fruit kept even at the lowest temperature evinced a more rapid browning of the skin than the fruit picked later. Its flavour throughout was only fair, tending to be tart and dry, and its texture was rather hard, and woody or gritty. A temperature of 32° preserved both lots of fruit for from thirteen to fourteen weeks, when browning developed, particularly in the lot picked early.

At present, perhaps the work which offers most promising results is a thorough investigation into temperature control in large chambers and holds. That there are variations is easily discovered by arranging throughout a chamber a set of bottles filled with salt solution and taking thermometric readings in the mornings before opening up, particularly when a chamber happens to have remained closed for a few days.

The problem of loading, in order to avoid an extremely low temperature, for lots of fruit stored early in a chamber, is one well worth considering. For instance, one lot may be stored early in the season close to an inlet duct and rapidly become cooled. A few days later a second lot may be stored in the same chamber, but away from the inlet duct, and cause an increase in the temperature of some parts of the chamber without in any way increasing the temperature of the first lot of

fruit near the inlet duct. As a result, when an extra volume of cold air is introduced the first lot may be subjected to too low a temperature, and, as I have already mentioned, many of our losses, both in pears and apples, would appear still to be due to injuriously low temperatures. Then, again, pockets of warmer air may exist owing to protection of some sort against air currents, and a lot of fruit may suffer the ill effects of too high a temperature. From these considerations it appears wise to load a chamber from the outlet duct towards the inlet duct, making allowance as usual for lateral and vertical air currents.

It is desirable, also, that fruits requiring a slightly lower temperature than others should be stored nearest either the coils or the inlet duct. Thus, where pears and apples are in the same chamber, the pears should be stored in the coldest part, and where, say, a chamber is filled with apples only, the Jonathan apples should be stored away from the coils or the inlet duct, in places of more moderate temperature.

Since there are these variations within a chamber, the question arises as to where a constant temperature should be maintained. The answer appears to be—where the temperature is lowest. For instance, in chambers cooled by air circulation, there are three places where the engineer may seek to maintain a steady temperature, firstly, at the inlet duct; secondly, in the centre of the chamber; and, thirdly, at the outlet duct. Differences of several degrees may be found between each of these places, according to whether loading is in progress, or whether the chambers are being opened frequntly or not. From inquiries into the methods of engineers, it is likely, I think, that most injuries which occur as a result of low temperatures are brought about early in the season, when an effort is being made to get the temperatures down. For this reason, it is recommended that the temperature of the incoming air should be carefully controlled, and that it should not fall as low as the freezing point of the fruit, which for most varieties is about 28° F.

If it is desired to cool a chamber down rapidly, this should be accomplished rather by increasing the volume than by lowering the temperature of the air passing into the chamber.

In chambers cooled by direct expansion, there are, perhaps, greater variations still than in chambers cooled by air circulation, and some method of creating air currents appears to be necessary. Temperatures near the coils and on the floor will always be found lower than in other parts of the chamber. At times, differences of 5° F. have been found in a small chamber. These differences would sometimes appear to be due to errors in construction, such, for instance, as having the coils running from the floor upwards instead of from the ceiling downwards.

Various means suggest themselves for securing circulation of the air and a more uniform temperature throughout such chambers, and no doubt a satisfactory method could easily be devised.

Finally, it is recommended that that essential instrument, a standard or a standardized thermometer, should be in use in every cool store. It is indispensable to the engineer in his difficult task of maintaining his temperatures and preserving every apple and pear to the complete satisfaction of all his patrons.

HOW TO LAY OUT A PACKING SHED.

By Basil Krone, Fruit-packing Instructor.

The Central Packing House business is yet only in its infancy in Victoria, and inquiries show that where organization is on the increase, consideration is being given to more up-to-date and efficient packing-sheds.

The accompanying plan, which can be modified to suit local requirements, has been prepared with a view to efficiency, and to economy in labour and handling costs. It is not drawn to any scale.

The production of a district will, of course, govern the size of the packing-shed required, but it may be mentioned that, even where a district's output does not exceed 500 cases a day, the shed should be at least 40 x 80 feet excluding the verandah, and the wall should be 12 feet high. Cramped space in a packing-shed increases handling costs. Fruit should be received at one side of the shed, and ultimately work its way through the different processes out the other side.

Sorting Conveyor and Sizing Machine.

Apples and pears should always be graded, and all blemished fruit sorted out before cool storing, otherwise the grower will be paying storage costs for fruit he will eventually discard. Some may not agree with this, believing that the tendency is for fruit to get bruised during grading operations. There is no doubt, however, that when grading and sizing are done properly less damage occurs than frequently happens to the fruit at picking time.

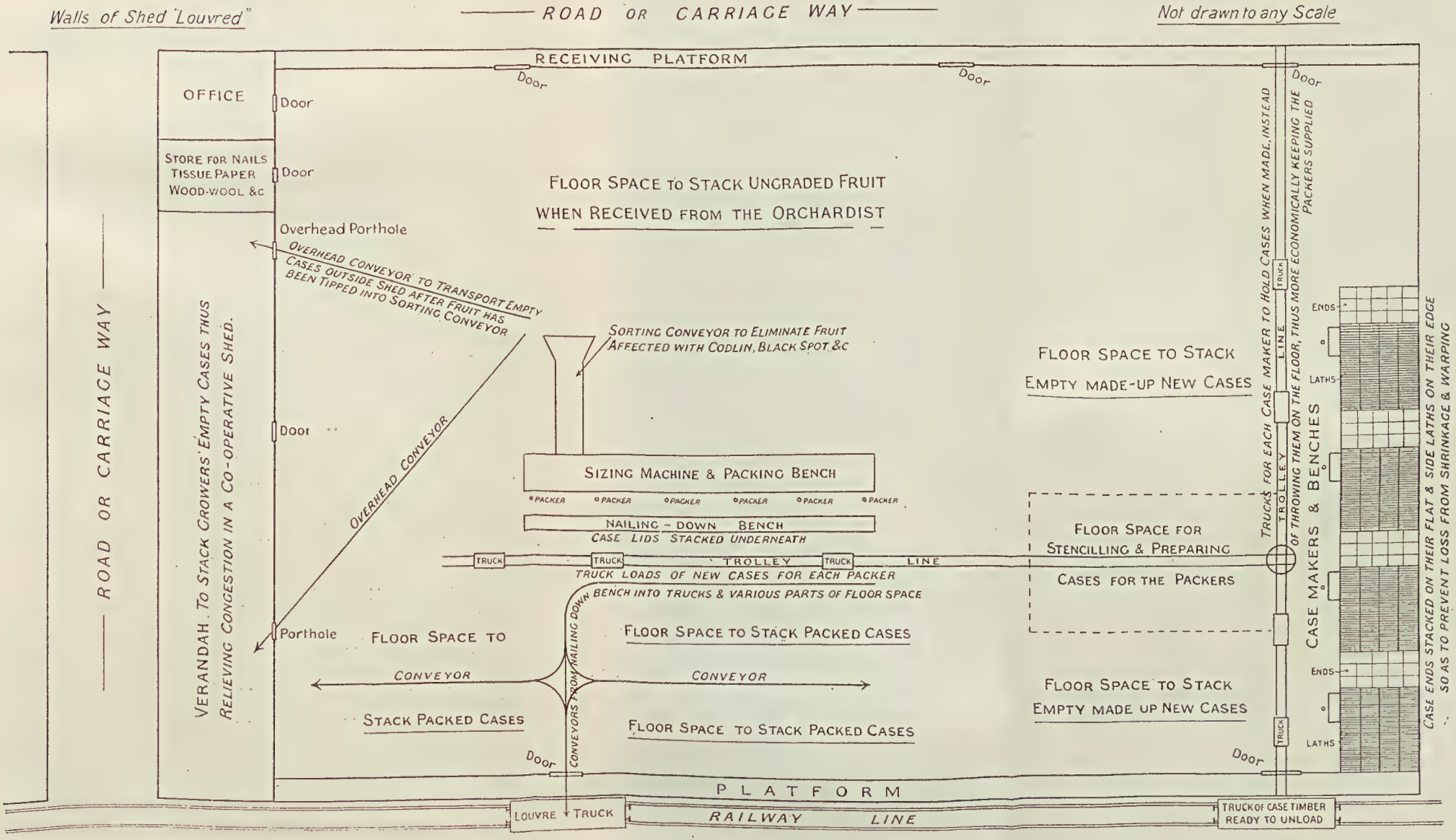
Stacking Case Timber to Prevent Loss.

When large quantities of case timber have to be purchased, side laths should be stacked on their edge, and ends on the flat. Experience shows that by adopting this method of stacking, loss by shrinkage and warping is greatly minimized. When making the cases up, the case-maker should not carry timber to his bench; the bench should be placed against the stack, and the timber worked out in a face.

Verandah and Overhead Conveyor.

These are special features. With them, the congestion sometimes noticed in a co-operative shed can be prevented. After the fruit has been tipped into the grader, the empty cases should not be stacked on the floor, as they will help to block up the shed. If gravity conveyors be installed (of course, they should be high enough for people to be able to walk underneath them), the cases can be transported out of the shed through port-holes or sliding windows, and slid down a broad plank to the verandah floor, where each grower's "empties" may be stacked separately, ready to be carted away. If built 15 feet wide, the verandah would hold approximately 1,500 empty cases.

Ground Plan of Packing and Case-making Shed.



Conveyors.

These should be placed beside the nailing-down bench, or trolley-line, to convey the packed cases direct into the railway truck, or to any part of the floor space kept apart for stacking them. By doing this, much time and labour costs in handling will be saved.

Nailing-down Bench.

It will be noticed that the nailing-down bench is placed close up to the packers, thus the packed cases can be swung directly to the bench; this obviates the necessity for the packer to walk across the floor. An ample supply of lids should always be kept neatly stacked beneath this bench. In the absence of a bench, 3″ x 1″ battens should be nailed parallel on the floor to minimize bruising. Nailing-down must never be done on a hard or uneven floor.

Trolley Line and Trucks.

The trolley line is placed very close to the nailing-down bench, so that the packers will not have far to reach for supplies of cases to pack into. In addition, the packed cases can be taken away by the operator swinging the case direct from his bench to the truck, instead of having to carry it across the shed. The trolley lines and trucks, therefore, serve a twofold purpose, and further loads of new cases can by this means be taken direct from the case-maker to the fruit-grower's waggon at the door. Trucks should be made to hold not less than 50 cases each.

Louvred Walls.

This can easily be arranged for when the weatherboards are being nailed on. Louvred walls are particularly recommended for districts where any quantity of citrus fruits will be packed.

Sizing Machines.

The idea of packing house equipment, if not new to our State, has seldom been put into action. It may, therefore, be well to meet the objection sometimes argued that a sizing machine works well in the case of the individual grower, but in co-operation it is a failure, because, while the "ends" of the different growers' fruit are being finished up from the machine by, perhaps, one or two packers, the rest are compelled to remain idle until the next grower's fruit can come through. This difficulty can, however, be overcome in sheds with a fairly large output by installing either two sizing machines, or else a "two-way" machine. Then, as the grading of No. 1 grower's fruit is nearing completion, a couple of packers only need be left to finish it, while the rest of the packers may commence dealing with No. 2 grower's fruit in the second machine.

The installation of a machine-grader, if not an absolute necessity, is certainly an advance step.

PLUM AND PRUNE CULTURE.

By J. M. Ward, Superintendent of Horticulture.

Introduction.

In Victoria and the other Australian States the production of plums and prunes is as yet in its infancy; this applies particularly in the case of prunes. Our climatic conditions and soils are well adapted for the production of either of these fruits, and, instead of being an importer of prunes, Australia should, and no doubt will, export large quantities overseas. The quality of Australian-grown prunes is equal, perhaps superior, to that of prunes produced anywhere else in the world.

The plum is a very old fruit. The Chinese have cultivated different kinds from time immemorial; they were also cultivated by the Greeks and Romans in the early days. As far as can be ascertained, the plum was taken to Constantinople and to Holland about the year 1576, and thence to England, where, in 1628, sixty named varieties were recorded Since that time the quality of the fruit has been greatly improved, and there has been a great increase in the number of varieties, and now there are something like 2,000 named varieties, a large number being of quite recent origin. New varieties are constantly being added to the list. Of course, a large number of sorts may be termed useless, so far as concerns commercial growers.

Plums are usually referred to as English or Japanese varieties; these are quite distinct types. The best varieties for practically all purposes are English, more correctly European, and are, as a rule, acknowledged to be superior to the Japanese. There are, however, some rather good kinds of the latter, but as yet not a single variety has been produced that has found such permanent favour with the public in Australia, America and Europe, as those belonging to *Prunus domestica* type. Neither do any of the American native species equal the European plums. According to Professor Hedrick, in "The Plums of New York," there are 24 distinct species of plums, and, for the grower, these can be reduced to three species—*Prunus domestica,* which includes all of our best varieties, as, for instance, Grand Duke, Golden Drop, Green Gage, Washington, Pond's Seedling, Monarch, Prune d'Agen, and other prunes; *Prunus triflora,* which includes the Japanese varieties, like Burbank, Abundance, Wickson, Satsuma, Ogan, &c., and *Prunus institia,* which includes the Damson family.

So far as plums and prunes are concerned, they may, for our purpose, be considered as one, for as can be seen by the foregoing they both belong to the one species, *P. domestica.* With perhaps a slight variation in pruning, the cultural practices are the same; but the methods of harvesting and handling the fruit are somewhat different, that is, unless both kinds are used as fresh fruit.

The use of the terms "plum" and "prune"* dates back for several centuries. The words come from different sources, one being of Anglo-Saxon origin and the other French. Originally they doubtless were synonymous in meaning. At what date the expression "prune" was first used to designate a "dried plum" or a plum capable of being dried

* "Prune" in French signifies "plum." In that language the dried plum is known as "pruneau"; French prunes have been exported from Bordeaux (France) to all parts of the world for very many years.

Fig. 1.—Four-year-old Plum-trees at Vermont (Vic.) Worked to Marianna Stock.

into a product having certain desirable characteristics is uncertain; however, the word has come to signify a plum which is capable of being dried without fermenting when the "pit" is not removed. The term also signifies the dried as well as the fresh fruit. A prune, therefore, is substantially a variety of plum which possesses certain characteristics. Most plums, if dried with the "pits" remaining in them, would ferment in the process. Prunes, in the fresh state, usually differ from plums, in having a firmer and drier flesh, a higher content of sugar, frequently a higher acid content, and further, are liable to be rather astringent until very ripe; in other words, a prune is a plum having these characteristics in a more marked degree than other plum varieties.

Sometimes the word "prune" is part of the variety name, as Prune d'Agen, Italian prune, and so on.

The area under plums and prunes in Victoria is 5,738 acres; for the other States the figures are:—New South Wales, 6,906 acres; Queensland, 1,047 acres; South Australia, 3,170 acres; Western Australia, 894 acres; Tasmania, 662 acres; a total of 18,417 acres for the Commonwealth.

The average fruitgrower is not generally interested as to what particular species a variety of plum may belong. He usually wants to know the best sorts to plant, and the best way to treat them to bring about profitable crops, and it is with this in mind that the writer has penned these lines.

Soils and Site.

The first subjects to which a planter should give attention are soil and site. The plum is adapted to a wide range of soils, but will not prove to be profitable if grown on poor land with a "hard pan" subsoil. There are some who consider that soils which will not grow apple trees satisfactorily may be used for plums. This is a most incorrect idea and will prove to be expensive for those who act on it. One also hears statements to the effect that plum trees will thrive on wet soils; this, to some extent, is also wrong. At the same time, plums will thrive under damper soil conditions than will the peach or apricot.

The soil should not be too dry, neither should there be a wet, stagnant subsoil. Any good loamy soil is suitable. The plum-tree will also grow well in heavy clay soils, but the largest and most regular yields of highest quality fruit comes from clay loams, i.e., the heavy, strong soils. Such soils require constant cultivation, especially throughout the summer months, for the purpose of retaining moisture.

Where irrigation is carried out, lighter sandy soils are very suitable. A sandy soil, with a good clay subsoil about 18 inches or 2 feet from the surface is also recommended. Generally speaking, the roots of the plum develop nearer the surface than those of the apple on seedling stock or of the pear.

Provided the soil is fairly good, there is no occasion to apply manure for a few years after planting. If it is of such a nature that fertilizers are needed to promote growth, it can be assumed that it is not suitable; that is, it is too poor, and will be expensive to manure when the trees arrive at the full-bearing stage. It is sometimes a good practice to apply a handful or two of some fertilizer such as blood and bone, or superphosphate to each tree when first planted; this will help

to give it a start in life; but care should be taken to keep the manure off the roots; if it is mixed amongst the soil around the tree, nature will do the rest.

Stocks to Use.

The question as to which is the best stock to use is open to controversy. Some growers favour Myrobalan, others Marianna, St. Julian, La France, &c.

Years ago the La France was very much used; later on, the Myrobalan and Marianna came more into prominence and at the present

Fig. 2.—Six-year-old Angelina Burdett Worked to Marianna Stock.

time in Australia, Myrobalan is probably used as a stock for plums more than any other variety. Fig. 1 shows a portion of a 4-year old plum orchard at Vermont (Victoria) on Marianna stocks.

In commenting on stocks used in propogating plum trees, C. F. Kinman, pathologist, in his Bulletin on "Plum and Prune Growing in the Pacific States," states:—"In his selection of stocks the nurseryman is guided by the demand of orchardists for trees propagated on one stock or another, and by his own interest in producing cheaply-propagated trees which make a rapid growth. For propagating plum-trees, the Myrobalan plum and the peach are by far the most important, although the almond is used in some localities, at least in California.

An occasional orchard may also be found where the Marianna plum and the apricot are used for stocks. Each of the first three stocks mentioned is suited to different soil conditions, and the Myrobalan plum and the peach are suited to the soils generally chosen for plum planting. The Myrobalan plum is preferred for deep, heavy fertile soils, especially if the rainfall is heavy or the orchard is under irrigation. It is not a rampant grower, but is a vigorous, long-lived, hardy, and deep-rooted tree, the roots withstanding a higher soil-moisture content than other kinds of roots. The Myrobalan plum, however, prefers a deep, fertile, heavy, well-drained loam and is therefore at

Fig. 3.—Six-year-old Grand Duke on Marianna Stock.

home in soils favored for prune production and is in most general use in that industry. It is also the one most commonly used for planting in the deep, fertile bottom lands, where plums are grown for the fresh-fruit market and for canning. The peach root, while less resistant to excessive soil moisture than the Myrobalan plum, will thrive better than the latter or other stocks mentioned, in poor, shallow, or light soils, because its roots do not go so deeply into the earth, but make a vigorous, spreading growth. A good moisture content and a soil of good tilth are, of course, required for the best root growth of the peach. It starts growth early in the spring, grows rapidly, succeeds in a wide range of soils, and is generally considered the most satisfactory stock

for early-ripening plum varieties, at least in the shallower soils, where these varieties are extensively grown. It is used to a considerable extent for varieties for prune-making where the soil is not sufficiently deep or the moisture content is below that required for the best development of the Myrobalan roots.

"The almond, one of the stocks used in California, is a thrifty long-lived tree, growing best in deep fertile well-drained soil and is the most drought-resistant of the stocks commonly used. It does not with-

Fig. 4.—Young Stocks grown from Seed Planted the Same Day in the Same Row. The five on the left should be disregarded, as they will produce "dud" trees in the future. The remaining four should produce strong and vigorous trees when worked.

stand excessive soil moisture as well as the peach or the Myrobalan plum, but succeeds in places where it is too dry for those stocks. The plum-tree is generally considered to grow less rapidly on the almond root than on the others commonly used and is propagated less extensively on it than on the others. The almond is used to a considerable extent as a stock for prunes in deep fertile soils not under irrigation. Large old prune trees which have excellent records of fruit production are found growing on this stock.

"The Marianna plum is employed as a stock for plums in California, but it is more sensitive to drought and to excessive soil moisture than the other stocks, suckers badly, and is generally little used. It grows quickly and well from cuttings, which ensures cheap and uniform stocks.

"In the North-Western States the Myrobalan plum has been used almost exclusively as a stock since plum-growing became an important industry there; but in California, where fruit-growing is a more diversified industry and the growing of plums for fresh shipment is a comparatively new and rapidly increasing enterprise and the demand for

Fig. 5.—A Black Diamond at Croydon Worked on its own Roots.

different fruits has fluctuated considerably, the stock which is at present considered best for planting under a given condition is not the one found in the orchard in a great number of instances. Much superficial testing of different stocks has been in progress, and the changing popularity of varieties has caused many orchards to be grafted to other fruits or varieties, although the tree which then becomes the stock is not in all cases the one on which the new variety should be grown."

The writer, having visited most of the districts of the Pacific States, readily agrees with the foregoing views.

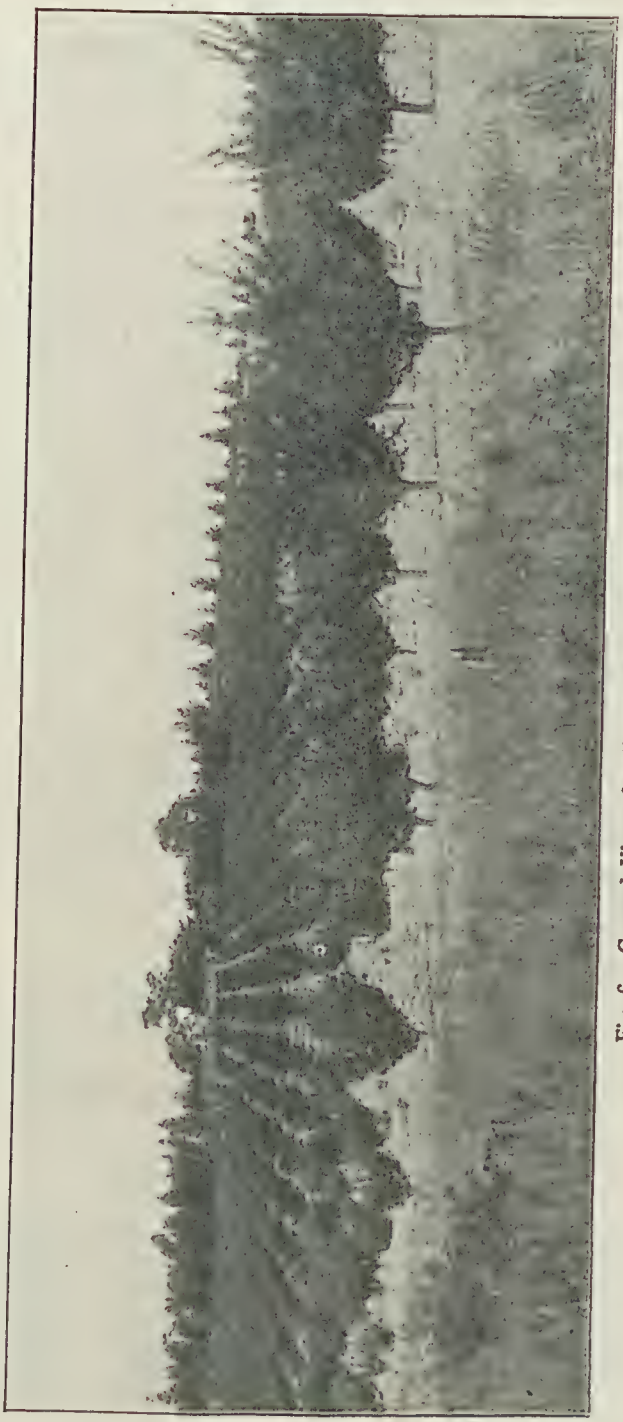


Fig. 6.—General View of a Young Plum Orchard at Croydon.

Fig. 2 shows an Angelina Burdett plum worked to Marianna stock, whilst in Fig. 3 a six-year-old Grand Duke is shown on the same stock. Both the Myrobalan and Marianna stocks can be propagated from cuttings and this method of propagation is the one now chiefly adopted in Australia by most nurserymen. Prior to the war most of the nurserymen imported the Myrobalan seeds from France, and thus propagated their plum and prune stock from seed. During the war the obtaining of these seeds was a difficult matter, hence the adoption to some extent of the cutting stock.

The writer is of opinion that this is a retrograde step and considers we would have more vigorous-growing and longer-lived trees if they were worked directly upon the stock raised from seed, more particularly if the seedlings were carefully selected and only the stronger plants used. (See Fig. 4.) A better rooting habit is usually obtained when stocks are grown from seed.

In the Stanthorpe (Queensland) district can be seen many fine vigorous-growing plum-trees that have been top-worked to peaches. The peach in this district appears to be a very suitable stock for the plum. Fig. 5 illustrates a healthy young "Black Diamond" in the Croydon district, worked upon its own roots.

Growers of plums are advised to observe the stock their trees have been worked upon and whether the stock was raised from a seed or a cutting and to note the growth and cropping of the various trees upon different stock; by doing this and keeping a careful record they should be in a position to arrive at a conclusion as to which is the best stock for their particular district and soil, and also as to which stock best suits a certain variety.

By having such valuable information the nurseryman can be advised or guided when making a selection of stocks for different plums.

The question of stocks for various fruit trees is a much more important one than appears on the surface, and in this respect growers, nurserymen, and officers of the Department should work in conjunction with each other for the benefit of all.

(To be Continued.)

POTATO EXPERIMENTS, 1924–25.

(Continued from page 471.)

By J. T. Ramsay, Potato Expert.

Results at Korumburra, Catani, Thorpdale, and Trentham East.

The results of the experiments with manures on potatoes at the above places during the past season are submitted herewith. A standard variation of manures was applied at each place, ranging from a light dressing of 3 cwt. to 9 cwt. per acre. The soils are in every case typical of much that is being utilized for potato-growing in Victoria. At Trentham and Thorpdale they are chocolate loam, but that at Catani is a peat, while Korumburra is a grey clay loam.

The results at Catani and Korumburra were considerably reduced owing to the crops there being attacked early in the season with Irish

Blight, which caused considerable damage. At Thorpdale and Trentham the season was favorable, and clean crops were harvested.

The object of the trials is to demonstrate the value of manuring, and to determine what particular manure and the quantity per acre most likely to give the greatest yield.

Lime over half the area at each was applied in the form of ground limestone at the rate of 1 ton to the acre; but, as in other years, there was no appreciable benefit from its application at any of the centres. This applies only as far as the weight of the crop harvested is concerned; as far as the quality matters, there is a decided improvement from the application of ground limestone.

As forecasted in the article dealing with the Millbrook results for the past season, given in this *Journal* in August, the price of £8 per ton used to calculate and express in money the value of the yield, is much below what the average price for the season has proved to be. Notwithstanding this, however, a glance at the tables given hereunder will show the very appreciable increases in cash value which have been obtained from some of the manures.

The soils at each of the centres dealt with are much more responsive to manuring than the red volcanic loam at Millbrook, and, as a result, the heavier dressings of from 6 cwt. to 7 cwt. show very much better results than do the lighter dressings.

The tables of results are practically self-explanatory, and there is little need to comment on them, as it must be obvious to those interested, from reading the figures, that judicious manuring is a highly profitable proposition.

RESULTS OF POTATO EXPERIMENTS, KORUMBURRA, 1924–25.

Plot.	Manures.	Market Sized Tubers.	Increase from Manure.	Cost per Acre of Manures.	Increased Value per Acre.
		T. c. q.	T. c. q.	£ s. d.	£ s. d.
	Limed Portion.				
1	3 cwt. super. per acre	2 10 0	0 10 0	0 18 9	**4 0 0**
2	6 cwt. super. per acre	3 0 0	1 0 0	1 17 6	**8 0 0**
3	9 cwt. super. per acre	2 10 0	0 10 0	2 16 6	**4 0 0**
4	6 cwt. super., 1 cwt. pot. sulph. ..	3 0 0	1 0 0	2 13 0	**8 0 0**
5	No manure	2 0 0	..	..	..
6	6 cwt. super., 1 cwt. amm. sulph. ..	3 0 0	1 0 0	2 16 0	**8 0 0**
7	6 cwt. super., 1 cwt. amm. sulph., 1 cwt. pot. sulph.	3 0 0	1 0 0	3 11 6	**8 0 0**
8	3 cwt. market garden manure ..	2 10 0	0 10 0	1 7 6	**4 0 0**
9	3 cwt. basic super.	2 10 0	0 10 0	0 18 6	**4 0 0**
	Unlimed Portion.				
1	3 cwt. super. per acre	3 10 0	2 0 0	0 18 9	**16 0 0**
2	6 cwt. super per acre	3 15 0	2 5 0	1 17 6	**18 0 0**
3	9 cwt. super. per acre	3 15 0	2 5 0	2 16 6	**18 0 0**
4	6 cwt. super., 1 cwt. pot. sulph. ..	3 0 0	1 10 0	2 13 0	**12 0 0**
5	No manure	1 10 0	..	..	..
6	6 cwt. super., 1 cwt. amm. sulph. ..	3 18 0	2 8 0	2 16 0	**11 4 0**
7	6 cwt. super., 1 cwt. amm. sulph., 1 cwt. pot. sulph.	4 5 0	2 15 0	3 11 6	**22 0 0**
8	3 cwt. market garden manure ..	3 0 0	1 10 0	1 7 6	**12 0 0**
9	3 cwt. basic super.	3 0 0	1 10 0	0 18 6	**12 0 0**

RESULTS OF POTATO EXPERIMENTS, CATANI, 1924–25.

Plot.	Manures.	Market Sized Tubers.	Increase from Manure.	Cost per Acre of Manures.	Increased Value per Acre.
		T. c. q.	T. c. q.	£ s. d.	£ s. d.
	Limed Portion.				
1	3 cwt. super. per acre	3 12 0	1 7 0	0 18 9	10 16 0
2	6 cwt. super. per acre	3 13 0	1 8 0	1 17 6	11 4 0
3	9 cwt. super. per acre	5 0 0	2 15 0	2 16 6	22 0 0
4	6 cwt. super., 1 cwt. pot. sulph. ..	4 2 0	1 17 0	2 13 0	14 16 0
5	No manure	2 5 0	..	..	..
6	6 cwt. super., 1 cwt. amm. sulph. ..	6 11 0	4 6 0	2 16 0	34 8 0
7	6 cwt. super., 1 cwt. amm. sulph., 1 cwt. pot. sulph.	5 17 0	3 12 0	3 11 6	28 16 0
8	3 cwt. market garden manure ..	4 4 0	1 19 0	1 7 6	15 12 0
9	3 cwt. basic super.	3 17 0	1 12 0	0 18 6	12 16 0
	Unlimed Portion.				
1	3 cwt. super. per acre	3 7 0	1 2 0	0 18 9	8 16 0
2	6 cwt. super. per acre	4 12 0	2 5 0	1 17 6	18 0 0
3	9 cwt. super. per acre	5 6 0	3 1 0	2 16 6	24 8 0
4	6 cwt. super., 1 cwt. pot. sulph. ..	2 15 0	0 10 0	2 13 0	4 0 0
5	No manure	2 5 0	..	..	..
6	6 cwt. super., 1 cwt. amm. sulph. ..	5 18 0	3 13 0	2 16 0	29 4 0
7	6 cwt super., 1 cwt. amm. sulph., 1 cwt. pot. sulph.	5 10 0	3 5 0	3 11 6	26 0 0
8	3 cwt. market garden manure ..	3 5 0	1 0 0	1 7 6	8 0 0
9	3 cwt. basic super.	3 10 0	1 5 0	0 18 6	10 0 0

RESULTS OF POTATO EXPERIMENTS, TRENTHAM EAST, 1924–25.

Plot.	Manures.	Market Sized Tubers.	Increase from Manure.	Cost per Acre of Manures.	Increased Value per Acre.
		T. c. q.	T. c. q.	£ s. d.	£ s. d.
	Limed Portion.				
1	3 cwt. super. per acre	8 0 0	5 10 0	0 18 9	44 0 0
2	6 cwt. super. per acre	8 10 0	6 0 0	1 17 6	48 0 0
3	9 cwt. super. per acre	7 10 0	5 0 0	2 16 6	40 0 0
4	6 cwt. super., 1 cwt. pot. sulph. ..	7 17 2	5 7 2	2 13 0	42 18 0
5	No manure	2 10 0	..	..	..
6	6 cwt. super., 1 cwt. amm. sulph. ..	7 10 0	5 0 0	2 16 0	40 0 0
7	6 cwt. super., 1 cwt. amm. sulph., 1 cwt. pot. sulph.	7 10 0	5 0 0	3 11 6	40 0 0
8	3 cwt. market garden manure ..	6 5 0	3 15 0	1 7 6	30 0 0
9	3 cwt. basic super.	6 0 0	3 10 0	0 18 6	28 0 0
	Unlimed Portion.				
1	3 cwt. super. per acre	8 5 0	5 5 0	0 18 9	42 0 0
2	6 cwt. super. per acre	8 5 0	5 5 0	1 17 6	42 0 0
3	9 cwt. super. per acre	7 5 0	4 5 0	2 16 6	34 0 0
4	6 cwt. super., 1 cwt. pot. sulph. ..	7 5 0	4 5 0	2 13 0	34 0 0
5	No manure	3 0 0	..	..	..
6	6 cwt. super., 1 cwt. amm. sulph. ..	7 5 0	4 5 0	2 16 0	34 0 0
7	6 cwt. super., 1 cwt. amm. sulph., 1 cwt. pot. sulph.	7 10 0	4 10 0	3 11 6	36 0 0
8	3 cwt. market garden manure ..	6 5 0	3 5 0	1 7 6	26 0 0
9	3 cwt. basic super.	6 15 0	3 15 0	0 18 6	30 0 0

RESULTS OF POTATO EXPERIMENTS, THORPDALE, 1924–25

Plot.	Manures.	Market Sized Tubers.	Increase from Manure.	Cost per Acre of Manures.	Increased Value per Acre.
		T. c. q.	T. c q.	£ s. d.	£ s. d.
	LIMED PORTION.				
1	3 cwt. super. per acre	3 15 0	2 5 0	0 18 9	18 0 0
2	6 cwt. super. per acre	4 5 0	2 15 0	1 17 6	22 0 0
3	9 cwt. super. per acre	3 15 0	2 5 0	2 16 6	18 0 0
4	6 cwt. super., 1 cwt. pot. sulph. ..	4 0 0	2 10 0	2 13 0	20 0 0
5	No manure	1 10 0	..	..	..
6	6 cwt. super., 1 cwt. amm. sulph. ..	3 15 0	2 5 0	2 16 0	18 0 0
7	6 cwt. super., 1 cwt. amm. sulph., 1 cwt. pot. sulph.	4 0 0	2 10 0	3 11 6	20 0 0
8	3 cwt. market garden manure ..	3 15 0	2 5 0	1 7 6	18 0 0
9	3 cwt. basic super.	3 5 0	1 15 0	0 18 6	14 0 0
	UNLIMED PORTION.				
1	3 cwt. super. per acre	3 12 0	2 2 0	0 18 9	16 16 0
2	6 cwt. super. per acre	4 0 0	2 10 0	1 17 6	20 0 0
3	9 cwt. super. per acre	3 15 0	2 5 0	2 16 6	18 0 0
4	6 cwt. super., 1 cwt. pot. sulph. ..	3 15 0	2 5 0	2 13 0	18 0 0
5	No manure	1 10 0	..	..	..
6	6 cwt. super., 1 cwt. amm. sulph. ..	4 0 0	2 10 0	2 16 0	20 0 0
7	6 cwt. super., 1 cwt. amm. sulph., 1 cwt. pot. sulph.	4 0 0	2 10 0	3 11 6	20 0 0
8	3 cwt. market garden manure ..	2 17 2	1 7 2	1 7 6	11 0 0
9	3 cwt. basic super.	3 2 2	1 12 2	0 18 6	13 0 0

EFFICIENCY SPELLS SUCCESS OR FAILURE.

Conditions in agriculture are still upset because of the tremendous new acreage given to planting during the world war. Farmers' troubles grew out of excess production. Our farmers produced more than could be consumed by our own people, and there was lacking a remunerative market abroad.

Where is the surplus? The world's supply of food is only about 30 days ahead of famine.

The greatest injury to the farmer and our nation is the continual "Fallacy of Over-production." It is "Under-production per Acre" that affects the prosperity of the farmer, limits his purchasing power, and adds to the cost of high living.

If it cost 1.23 dollars per bushel to produce 12 bushels of wheat per acre, the farmer who produces 30 bushels per acre can make money at 75 cents per bushel.

The farmer can be assured of the American market for his products by an adequate protective tariff. Extensions of credit, improved methods of distribution, equitable freight rates, reduced tax rates all go a long way to make his life a happier one.

But in the final analysis it is the degree of efficiency with which the farmer operates his farm that will spell success or failure.

—*San Francisco Chronicle.*

FARMERS' FIELD DAY AT STATE RESEARCH FARM.

During the past twelve years it has been the practice to hold a Field Day at the State Research Farm during Show week, to enable people from country districts an opportunity to visit the Farm and see what is being done there. The attendance this year was about 800, a considerable increase over that of any previous year. The weather was ideal, the only complaint being that the time available for the inspection of all there was to be seen was too brief, and during the afternoon the Director of Agriculture (Dr. Cameron) announced that next year an endeavour would be made to arrange for a full day's inspection of the Farm.

In welcoming the visitors, the Premier (Hon. J. Allan, M.L.A.) said the Government fully realized what agriculture meant to the State, and it was their aim to bring about increased production from every acre of land. As a farmer himself, he knew it was impossible for the ordinary farmer to do much in the way of experimenting, and it was to perform this work that the Research Farm had been established. There, he said, efforts were being made to prove what were the best crops for differing conditions and what were the best methods of growing those crops. In Victoria there was little new land that could be opened up; therefore, the best use would have to be made of that already under cultivation. This could be done by improving agricultural methods, and it was only by patient experiments that these could be ascertained.

His Excellency the Governor (Lord Stradbroke) expressed his pleasure at being present. If farming was to be a success, he said, science and practice must go hand in hand. The agricultural and pastoral industries of Australia were responsible for a large proportion of the country's wealth, and expenditure in further developing those industries was a wise policy. He believed that in Australia the Government were doing more for the farmer than was done in England, though there the Rothamsted Experimental Station, established 80 years ago, had been responsible for much improvement in cultivation. In every modern factory chemists and other scientists were continually analyzing and testing the products and carrying out researches that would lead ultimately to more economic production. In agriculture, however, it was not possible to have such a staff even in a district, and a centralized staff such as was provided by the Department of Agriculture was the only alternative. The work of the departmental officers had already resulted in increased production, particularly in wheat-growing. Twenty-five years ago the average yield in the Wimmera was only 7½ bushels per acre; to-day it was 21 bushels.

Continuing, His Excellency said that similar improvement could be brought about in other branches of agriculture, and also in dairying. If dairy farmers were to get a bigger profit out of their land it was essential they should improve their herds. Their objective should be to get two cows to yield the quantity of butter-fat formerly produced

by three. To do this they must get rid of the inferior animals. Denmark was a country well ahead in dairying, and therefore they should look to that country for guidance. Danish dairy farmers were most careful in selecting bulls, and perhaps that was a lesson we had not fully learned here. The cost of production was going up on every side, and it could only be met by increasing the yield from the land and by introducing economies wherever possible. This could be done by the use of improved implements. Another very important feature in many districts was drainage. In England some land gave back much more than the cost of putting down tiled drains, and it might be that here that some of our swamp lands would be sweetened and become productive if properly drained.

In concluding, His Excellency said that he was glad to notice that during the last year the number of houses built in the State was 12,900. This, he thought, was a good sign, for if there was to be an increase in immigration, immigrants should be given a comfortable home in which to live.

At the conclusion of Lord Stradbroke's speech cheers were accorded him at the instance of Colonel Bourchier (Minister of Agriculture).

An inspection of the experimental plots was then made under the guidance of Mr. H. A. Mullett (Agricultural Superintendent), who explained the different rotations being tested to ascertain the most profitable system of cropping for wheat and oats on land with a 20-inch rainfall. One outstanding result, he said, had been the marked increase in crop yield obtained wherever either the hay or the wheat had been preceded by a well-worked fallow. In the case of oaten hay, for instance, the average increase in yield had been 24.3 cwt. per acre above the yield of the plot continuously cropped.

After the various lucerne experiments being carried on had been detailed by Mr. L. C. Bartels, a move was made to the irrigated pastures where the farm manager (Mr. H. C. Wilson) described the methods adopted in sowing and maintaining the pastures.

The visitors were then divided into groups. Those interested in the cereal experimental plots were piloted over them by Mr. Mullett and Mr. Gordon. Others, with Mr. Wilson as guide, inspected the sheep and some listened to a brief lecture on the dairy cattle by Mr. J. M. Kerr, while a fourth group were shown over the poultry-yards by Mr. Rugg.

When afternoon tea had been partaken of Councillor Hawthorn, of Kerang, moved a vote of thanks to the officers of the Department. In seconding the vote Councillor O'Brien, of Bendigo, said that whatever was spent on agricultural experimental work would be returned to the State tenfold. He complimented the Department on three of the wheats—Gallipoli, Rajah and Ranee—that had been raised at the farm. He very strongly urged the establishment of an experimental station in the north of Victoria. (Hear, hear.)

In supporting the vote of thanks Mr. Lemmon, M.L.A., said that though he did not represent a country constituency, much of the phosphate used by the farmers came from his (Mr. Lemmon's) district. He always urged expenditure on education, and the Research Farm was certainly an educational institution. If technical education were necessary for the artisan it was equally necessary for the man on the land

and if the rural community was not prosperous it was a bad lookout for the metropolitan area.

In acknowledging the vote of thanks Colonel Bourchier (Minister of Agriculture) said he was delighted to see the farming community taking such a keen interest in the work of the Research Farm. The old methods of farming had given way to more scientific methods. Because of this the wheat yields, for example, had vastly improved. The average yield for the last ten years showed an increase of 5 bushels per acre over that of the previous ten years. Since the area sown annually to wheat in Victoria was 3,000,000 acres, that meant an increase in our harvest of 15,000,000 bushels, worth approximately £5,000,000.

More scientific methods were also required in dairying, and this was being recognized by herd test associations throughout the State and as far as the Government was concerned it had shown its practical interest by subsidizing these associations to the extent of £5,000 per annum.

As Minister, Mr. Bourchier said he owed a great deal to the staff of the Department headed by Dr. Cameron, and he was sure there was no need to eulogize the officers; as practical men, his hearers would be able to sum them up.

Dr. Cameron (Director of Agriculture) also acknowledged the vote of thanks. He said that whatever had been accomplished at the Farm was achieved by team work—by the members of the staff sinking their individuality and all working together. Since the Farm's inception thirteen years before, its average yearly cost over and above expenses had been £2,000, and during the same period the yearly value of our wheat yield had increased by £2,000,000.

Dr. Cameron pointed out that the primary production of the State was worth £52,000,000 per annum, as against £48,000,000 the value of our manufactured goods. Yet while £250,000 was spent annually on technical education in connection with our secondary industries, only £20,000 a year was spent on technical education in connection with our primary industries. Obviously the latter were deserving of educational facilities at least equal to those of the secondary industries.

EXPERIMENTS WITH WHEAT AND OATS.

State Research Farm, Werribee.

PERMANENT FERTILIZER TRIALS.

When superphosphate was first introduced as a manure for wheat, and dressings of 56 lbs. per acre, and even lower than that, were advocated, to many it seemed beyond the bounds of common sense that so small a dose could appreciably affect yields. The grounds for this early scepticism are not hard to understand when it is remembered that the top 3 inches of soil weighs between 300 and 400 tons, and that actually only a fraction (about one-fifth) of the small dressing of manure is of direct benefit to the plant. To-day so widespread is the use of "super."

on our Australian wheat soils and so consistent are the results, that the phenomenal response of the average soil to the manure has become commonplace, and it is only when the seed drill happens to miss sowing the regular quantity of manure that the farmer is reminded of the vital part which this light dusting plays in producing profitable yields.

The Importance of Determining the Most Profitable Dressing.

The problem of to-day is not, however, one in which the advisability of the use of superphosphate is questioned, but rather to ascertain how much to use. It can be shown that this quantity varies with a number of factors, and that its determination with some degree of precision is a matter of considerable importance. Experiments show that on most soils there is a steady and proportionate increase in the yield as the amount of the manure applied is increased until a point is reached after which the same ratio is not maintained, until eventually there is no response to further dressings. Obviously, then, in practice it is necessary to determine the manurial application which gives the greatest net profit, and this is not necessarily that which gives the highest yield. It will follow, also, that the higher the price of wheat the greater will be the profit per acre.

Lay-out of the Plots.

Prior to 1921 the fertilizer trials comprised a series of 40 plots, of which in any one year 21 were regularly sown to wheat. The rest were in bare fallow. The plots were each $\frac{1}{4}$-acre in area, and were designed to be permanent, *i.e.*, the same manurial treatment was to be continued on each plot for a number of years. With a view to determining the effect of these same fertilizers on oats the plots were in 1921 halved—one half being sown to wheat and the other to oats. Thus there are now 80 plots each $\frac{1}{8}$-acre in area. The permanent character of these plots makes them more important than the usual fertilizer trials On every occasion on which these plots come under crop the manurial dressing applied to each will be the same. The effects due to the different dressings of fertilizers will become more and more noticeable as the years go by, and interesting changes in the fertility of the soil in the various plots may be looked for. Thus it will not only be possible to determine the immediate effect of the various fertilizers, but the cumulative effect as well, and the general influence of each fertilizer on the quality and stock-carrying capacity of the resultant pasture.

Wheat.

The average yields of wheat for the past twelve years are summarized in the table below. They are given for the whole period, and also for the last five years. It will be seen that, except on the continuously-cropped plots, the results during the five-year period are very much higher than those for the twelve-year period. Even taking into consideration the fact that during the first seven years of the test, four very poor seasons were experienced, with correspondingly low yields, and that the last five seasons have been good, it is evident that suitable applications of water soluble phosphates in the form of superphosphate are not only profitable, but are maintaining, if not improving, the crop yields.

TABLE I.—EFFECT OF FERTILIZERS ON YIELD OF WHEAT.

Application per acre.	For 12 years, 1913–1924.
	Bushels per acre.
Superphosphate 1 cwt.	16·3
Farmyard Manure 10 tons	14·6
Farmyard Manure 10 tons + Lime 10 cwt.	14·4
No Manure	7·8
Super. ½ cwt.	14·8
Super. 1½ cwt.	19·4
Super. 2 cwt.	19·8
Super. 1 cwt. + Nitrate Soda ½ cwt. (with seed)	17·8
Super. 1 cwt. + Nitrate Soda ½ cwt. (in Spring)	17·8
Super. 1 cwt.	17·2
Super. 1 cwt. + Sulp. Potash ½ cwt.	17·2
Super 1 cwt. + Sulph. Potash ½ cwt. + Nitrate Soda ½ cwt.	17·1
Bone Fertilizer 1 cwt.	11·3
Thomas's Phosphate 1 cwt.	13·0
Super. ½ cwt. + Thomas's Phosp. ½ cwt.	16·0
Super. 1 cwt. + Lime 5 cwt.	16·6
Super. 1 cwt. + Lime 10 cwt.	16·5
Super. 1 cwt. + Lime 20 cwt.	16·5
Super. 1 cwt.	15·2
No Manure (cropped continuously)	5·2
Super. 1 cwt. (cropped continuously)	9·1

Superphosphate (18% P_2O_5) used throughout. Lime used was air-slaked.

The following table summarizes the net profits from light and heavy dressings of superphosphate, bone fertilizer and basic slag:—

TABLE II.—HEAVY AND LIGHT DRESSINGS OF PHOSPHATES APPLIED TO WHEAT GROWN ON BARE FALLOW AT WERRIBEE—TWELVE YEARS' RESULTS.

Treatment.	Yield per Acre.	Increase over No Manure Plot.	Value of Increase at 5s. Bushel.	Cost of Manure per Acre.	Net profit per Acre after deducting Cost of Manure.
	Bushels.	Bushels per acre.	*s. d.*	*s. d.*	*s. d.*
No Manure	7·8	—			
Bone Fertilizer 1 cwt.	11·3	3·5	17 6	9 0	8 6
Thomas's Phosphate 1 cwt.	13·0	5·2	26 0	5 6	20 6
Super. ½ cwt. (18%)	14·8	7·0	35 0	2 6	32 6
Super. 1 cwt. (Check plot) „	17·2	9·4	47 0	5 0	42 0
Super. 1½ cwt. „	19·4	11·6	58 0	7 6	50 6
Super. 2 cwt. „	19·8	12·0	60 0	10 0	50 0

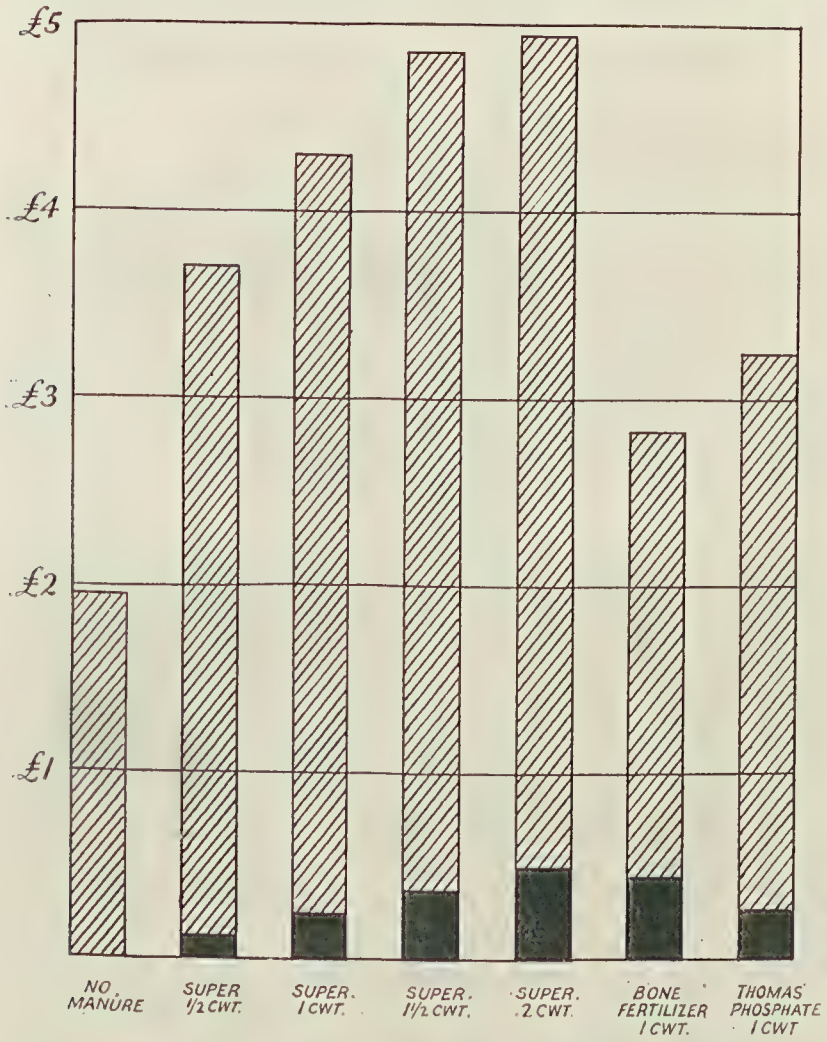
The graph below illustrates the results given in Table II., and clearly shows the relation between the value of the crop (indicated by the total height of each column) and the cost of the manure (indicated by the darker shaded portion).

In the case of superphosphate, it will be seen that there is a large margin of profit with each application. This margin increases as the

application increases from ½ cwt. to 1½ cwt.; while the yield is still greater with 2 cwt., the profit shows a slight decrease.

The graph also illustrates the superiority of superphosphate over bone fertilizer and Thomas's phosphate.

In addition to the immediate effect of fertilizers, shown during the season in which they are applied, there is also an indirect and



Graph showing comparison between value of wheat crop and cost of fertilizer used to produce it. (Total height of column indicates value of crop—the darker shaded part the cost of fertilizer.)

cumulative effect, due to the residue of the fertilizer which remains unused by the crop each year. In order to ascertain, if possible, the precise value of this factor, the plots, which for twelve years have received the same treatment year by year, have this year been sown without manure of any kind. The results, of course, will not be available until the end of the season.

In view of the fear often expressed that repeated applications of superphosphate have an injurious effect on the land, it should be noted that the results of these experiments afford no evidence in support of such a contention; on the contrary, the yields of plots treated with superphosphate year by year show no general decline.

Results of Permanent Fertilizer Trials with Wheat Summarized.

The results of these tests appear to justify the following conclusions:—

(1) Superphosphate is the most profitable of all the artificial manures that can be applied to the wheat crop.

(2) The quantity that can be profitably applied per acre is considerably in excess of that usually applied in the wheat areas.

(3) The indirect effect of the heavier dressing in stimulating the subsequent growth of the grass and increasing the stock-carrying capacity of the land is much greater than that of the lighter dressing.

(4) Thomas phosphate applied either separately or in combination with superphosphates gives less profit than the same quantity of super. applied by itself.

(5) Lime applied either in heavy or light dressings has not so far profitably influenced yields of wheat at Werribee.

(6) Nitrogenous and potassic manures do not profitably increase the yields, especially when bare fallowing is practised.

Oats.

Table III.—Effect of Fertilizers on the Yield of Oats.

Plot No.	Application per Acre.	Average Yield of Grain for Three Years. Bushels per acre.	Average Yield of Total Produce for Three Years. Cwt. per acre.
1	Super. 1 cwt.	42·0	46·8
2	Farmyard Manure 10 tons	48·4	51·3
3	Farmyard Manure 10 tons + Lime 10 cwt.	45·7	48·8
4	No Manure	25·8	25·8
5	Super. ½ cwt.	45·2	41·5
6	Super. 1½ cwt.	52·6	48·5
7	Super. 2 cwt.	52·3	48·8
8	Super. 1 cwt. + Nitrate of Soda ¼ cwt. (with seed)	49·7	46·8
9	Super. 1 cwt. + Nitrate of Soda ½ cwt. (in Spring)	48·9	48·3
10	Super. 1 cwt.	43·8	44·7
11	Super. 1 cwt. + Muriate of Potash ½ cwt.	47·1	47·7
12	Super. 1 cwt. + Muriate of Potash ½ cwt. + Nitrate of Soda ½ cwt.	49·4	49·2
13	Bone Fertilizer 1 cwt.	44·0	43·8
14	Thomas's Phosphate 1 cwt.	47·3	44·5
15	Super. ½ cwt. + Thomas's Phosphate ½ cwt.	46·3	45·5
16	Super. 1 cwt. + Lime 5 cwt.	48·9	49·2
17	Super. 1 cwt. + Lime 10 cwt.	45·5	51·2
18	Super. 1 cwt. + Lime 20 cwt.	40·4	47·5
19	Super. 1 cwt.	46·0	45·0
20	No Manure (continuously cropped)	15·3	17·5
21	Super. 1 cwt. (continuously cropped)	14·5	17·2

Results of Permanent Fertilizer Trials with Oats Summarized.

Owing to only three years' results being available it is rather soon to draw definite conclusions, but the figures appear to indicate—

1. That superphosphate is the most profitable fertilizer that can be applied to oats.
2. That about 1½ cwt. per acre appears the most profitable quantity to apply for either hay or grain purposes.

EGG-LAYING COMPETITION.

WINTER TEST AT BURNLEY.

By W. C. Rugg, Poultry Expert.

The fifteenth Victorian Egg-laying Competition conducted at the Burnley School of Primary Agriculture and Horticulture was commenced on the 1st April, 1925, and will be concluded on the 31st March, 1926. For the first four months of this competition, i.e., up to the end of July, the competitors are also contestants in what is known as the Winter Test. This year it was well named, for the weather throughout was very severe, the succession of heavy fogs, frosts, and wet and windy days experienced being much against high egg-production.

The Teams Test at Burnley is the most severe in the State, as, although a good house is provided for the birds to roost in, they spend most of their time out in yards under natural conditions, and exposed to all weathers. It is only birds with plenty of stamina and sound constitutions that can hope to come through the test showing a good profit over cost of food. Taking into consideration the weather conditions for the four months, the performances of the leading birds to date are very satisfactory, and reflect great credit on Mr. Macauley for his careful feeding and management.

This year the winning of prizes is being decided on the greatest market value of the eggs laid. For the purpose of valuation, the eggs are divided into first grade, valued at market price, and second grade, valued at market price less 25 per cent. During the first two months of the competition, an egg, to be placed in the first grade had to weigh not less than 1¾ ounces, and thereafter not less than 2 ounces. The minimum weight of a second-grade egg is ¼ ounce less than one of first grade.

This method of deciding a competition entails a great amount of work, as every egg laid has to be weighed, and the work must be done every day; but the information obtained and passed on to the owners of competing birds will be invaluable, as they will then know the exact weight of eggs laid by each individual bird, and so have definite information to guide them in their matings the following year. Thus they may breed for even a better-sized egg.

It is also hoped that the distribution of stock bred from these birds that lay standard-sized eggs will have a marked influence in improving

the size of the eggs laid by the stocks throughout the State, and so help Victoria to take her place as the leading egg-exporting State of the Commonwealth.

It is gratifying to note that, in the Teams Test, out of a total of 16,969 eggs laid, only 244 were under weight, and in the Individual Bird Test, out of a total of 14,123, only 171 were not up to the standard required.

Details of Best Performances in Winter Test, 1925.

Section A.

In *Class* 1, *Leghorns, Wet Mash,* Mr. Pocknall's team put up a good performance by laying 399 first-grade eggs out of a total of 453. No eggs under weight.

In *Class* 2, *Leghorns, Dry Mash,* Mr. C. Langley's team led by the narrow margin of 4d. (in value of eggs laid) from Mr. J. G. Alston's team, which laid 354 first-grade and 5 second-grade eggs. One egg was under weight.

In *Class* 3, *Black Orpingtons, Wet Mash,* Mr. J. Wear's team led; they laid 403 first-grade, 50 second-grade, and 34 third-grade.

From three teams of six birds each, in *Class* 9, *Rhode Island Reds,* the total of second-grade eggs for the four months was only six.

Section *B.*

In *Class* 1, *Individual Birds, White Leghorns, Wet Mash,* Mrs. A. Oxley's bird took first place with 98 eggs, 9 of which were second-grade. Mr. R. R. Christie's bird was second with 93 eggs, only 1 of which was second-grade.

Mr. G. A. Burchell's bird was the winner in *Class* 2, *Leghorns, Dry Mash.* The number of eggs laid was 93, all of first-grade. The entrants of the next three competitors, Messrs. P. N. Tilley, R. R. Christie, and T. A. Mentiplay, all laid first-grade eggs.

In *Class* 4, *Black Orpingtons, Wet Mash,* Mr. T. A. Mentiplay's bird was in first place with 107 eggs, only 2 of which were second-grade. Mr. McChesney's bird was second, with 105, and only 1 second-grade.

Following is the number of eggs laid in each section, and the percentage in each grade of those under weight:—

—	Total including Underweight.	1st Grade.	2nd Grade.	Underweight.
Section A, Groups of Six Birds, Trapnested.				
Eggs Laid	16,969	12,690	4,035	244
Percentage	..	74·8	23·8	1·4
Section B, Individual Birds.				
Eggs Laid	14,123	10,702	3,250	171
Percentage	..	75·8	23	1·2
Grand Total	31,092	23,392	7,285	415
Percentage	..	75·3	23·4	1·3

Prize Winners—Winter Test—1st April to 31st July, 1925.

SECTION A.—GROUPS OF SIX BIRDS TRAPNESTED.

——	Name and Address of Competitor.	Pen No.	Bird No.	No. of Eggs.			Value.	Breed.
				1st Grade.	2nd Grade.	Total.		
				LIGHT BREEDS.				
Six Birds.							£ s. d.	
1st Prize, Champion Certificate	G. Pocknall, 112 Dundas-street, Thornbury	20	..	399	54	453	4 3 8	White Leghorn
2nd Prize, Government Certificate	Claud Langley, Kidd's-road, Dandenong ..	36	..	342	39	381	3 8 11	,, ,,
Individual Birds.								
1st Prize, Champion Certificate	J. B. Nicoll, Lake-street, Reservoir ..	10	6	66	33	99	0 17 0	,, ,,
	R. R. W. Brown, Metropolitan Farm, Werribee (equal 1st)	38	1	86	8	94	0 17 0	,, ,,
				HEAVY BREEDS.				
Six Birds.								
1st Prize, Champion Certificate	J. Wear, Werribee	59	..	403	50	453	4 3 10	Black Orpington
2nd Prize, Government Certificate	All Varieties Stud Poultry Farm (J. C. Mickelburough,) Herald-street, Cheltenham	54	..	379	68	447	3 19 9	,, ,,
Individual Birds.								
1st Prize, Champion Certificate	C. C. Dunn, "Spero" Stud Poultry Farm, Cheltenham	51	4	97	1	98	0 18 0	,, ,,
2nd Prize, Government Certificate	C. E. Graham, "All Black" Poultry Farm, Portarlington	53	1	92	2	94	0 17 7	,, ,,

Prize Winners—*continued.*

SECTION B.—INDIVIDUAL BIRDS.

——	Name and Address of Competitor.	Pen No.	No. of Eggs.			Value.	Breed.
			1st Grade.	2nd Grade.	Total.		
			LIGHT BREEDS.			£ s. d.	
1st Prize, Champion Certificate	Mrs. A. Oxley, Wood-street, Newport ..	143	89	9	98	0 17 11	White Leghorn
2nd Prize, Government Certificate	R. R. Christie, "St. Elmo" Poultry Farm, Bentleigh	218	92	1	93	0 17 4	,, ,,
			HEAVY BREEDS.				
1st Prize, Champion Certificate	T. A. Mentiplay, Somerville	48	105	2	107	1 0 2	Black Orpington
2nd Prize, Government Certificate	H. R. McChesney, Hollingsworth-avenue, Hawthorn	9	104	1	105	0 19 9	,, ,,

CLASSING FARMERS' WOOL.

By George Wallace McDonald, Lecturer in Wool, Melbourne University, and Head of Sheep and Wool Department, Gordon Institute of Technology, Geelong.

Time has proved that the small flock-owner is in no way exempt from paying proper attention to the get-up of his clip. Wool brokers and others directly interested in the wool trade can show us where, by paying a little more attention to their wool, those in a small way can obtain just as high a return per head as the larger growers.

Of late years numerous large estates in Victoria have been subdivided, and are now being settled with mixed farmers, who are going in principally for wheat-growing, combined with the raising of fat lambs and wool.

It is pleasing to record at this stage that to-day a much keener interest is taken than formerly in the methods of wool-classing, for many growers have seen the necessity for adopting new ways, and have found that the increase in their net return more than justifies any extra expense or time involved. There are many, however, who continue to send their wool to market in the most unsaleable way, which must result in decreased prices and lessen the average return per head.

Of course, every one knows the adverse conditions against which the small grower has to contend. It is, for instance, impossible for him to shear wool as clean as the larger owners, for he must run his flock on the fallows and let them feed off the stubble. But I do say that, having grown his wool, he should not lessen its value by simply failing to give it proper attention at shearing time. One need only glance carelessly over the wool-brokers' show floors to see the faulty methods adopted in the preparation of numerous lots of farmers' wool, and too often in the case of wool marketed by the larger growers.

Common Wool Terms.

In making the following recommendations, I ask my readers to clearly understand that this article is written with the sole object of trying to assist growers anxious to improve their present methods. Before going into detail on the various branches of wool-classing, it would perhaps be as well to give brief definitions of some of the commoner wool terms.

Badly-bred Wool.—Wool showing no crimp at all, the fibres being quite straight. Mostly found in crossbred wools; also in merinoes running out.

Break.—Weakness in position of the fibre, though above or below the break it may be perfectly sound; usually caused through drought conditions or fever. Putting sheep on good, rich feed suddenly will break wool very quickly. When sheep are put on a rape or a lucerne crop, they should be kept there for a few hours only at a time until they get used to the feed.

Combing wool refers chiefly to merino wool over 1½ inches in length; this wool is used for making worsted goods.

Clothing wool refers to wool under about 1½ inches in length; it is used for making goods such as flannels, blankets, and rugs.

Burr.—Trefoil and Bathurst burr. The former is the worse, and, with the increased use of top-dressings, this burr is rapidly spreading.

It is removed from wool chiefly by such an agent as sulphuric acid at a certain strength in water; then by heat the burr is turned into carbon. This matter will be more fully discussed later.

Character.—Term applied to wool showing an even and defined crimp true to its breed.

Crimp refers to the little waves or curls seen on the wool fibre. This is spoken of by a number of growers as serrations, but it is not so. A reference to this will be made again later.

Count means the spinning quality of the wool; for instance, it means that 1 lb. of 64's tops (top is wool that has been scoured and combed) will spin 64 hanks, each hank containing 560 yards, the length of the wool in the whole 64 being about 20 miles. The coarser the wool, the less yarn it will spin.

Density refers to compactness of growth, which should be the aim of every breeder. Except in the case of a stud breeder, it does not pay to go in for fancy prices.

Dingy.—Of a heavy, dull, shabby appearance. This may be caused by yolk dust or perhaps tick.

Draft.—An allowance of 1 lb. per cwt. allowed to the buyer by the grower, chiefly owing to the irregular weight of wool caused by climatic conditions.

Inter-lotting is the grouping together on the show-floor of bales of wool of practically the same class and value, possibly from the same district but belonging to different owners, so as to avoid a star-lot.

Star Lot.—Three bales and under of the same brand, or 6 bales and under in inter-lots.

Serrations.—The outer scales or saw-like edges on the wool fibre invisible to the naked eye.

Slipe.—Wool removed from skins by the lime process. Now that painting and sweating is in use, this method is not much followed in Australia.

Sorting means the dividing up of a fleece into wool of various qualities. Although a fleece may be classed as c.b.k. on the station, that fleece may actually be sorted into three, four, or perhaps five classes for the worsted manufacture.

Tare.—The weight of a bale or bag deducted from the gross weight, as follows:—Bale, 11 lb.; large bags, 2 lb.; small, 1 lb.

Top.—This is a somewhat technical term, but an understanding of it is necessary for a full appreciation of Bradford quotations in market reports. It refers to wool that has first been sorted into even counts and then scoured and combed, all the short fibres being taken out. It is then in one continuous roll of lapping, the fibres lying parallel to each other.

Valuing is putting the count and yield on various bales of wool. Its true market value is calculated from a table of limits for that particular wool at that date.

Wool-fibre.—Each fibre is hollow, and is composed of numerous cells, which have little projecting edges called serrations; these interlock and assist in the felting of the wool; they are invisible to the naked eye.

Weighing.—Weighing in of wool on arrival at brokers with tested scales and by a sworn weigher. This is the only weight recognized between grower, seller, and buyer.

The Necessity for a Clean Shearing Shed.

A grower with only a few hundred sheep usually makes use of his shearing shed during the greater part of the year for the storage of seed, wheat, manure, chaff, &c. Of course, it gets very dirty, and before being again used for shearing the floor must be thoroughly swept. Although often apparently quite clean, there may still be chaff in the cracks, and this will, perhaps, work out gradually during shearing. Buyers, seeing bits of chaff in the wool, naturally become suspicious, for they do not know how much of it may be affected. Further, the presence of even a little chaff will create the impression that there has been no care in the preparation of the wool, and it suffers in value accordingly.

If it is not the practice of an owner to have his sheep crutched, he should have those requiring it dagged before they come to the shearing-board. In these time, however, when the blow-fly is gradually working its way further south, it will pay every sheep-farmer to have his sheep crutched at the right time.

Skirting.

It is sometimes said that it does not pay to skirt wool, as while the skirted wool will bring a better price, the increase is not sufficient to compensate for the loss in weight. Occasionally, one may even hear the remark, "So-and-so skirts and classes his wool, yet he gets no more for it than I do for mine."

To the first statement the reply is—Speculators will buy unskirted wool and skirt and roll it, and sell it again at a profit; that, surely, is sufficient proof that it pays to skirt. The skirting must, of course, be done properly, and no fribby ends should be left on the fleece, nor should more wool than is necessary be taken off them. In answer to the second statement, I would say that, to many people with no technical knowledge of wool, one fleece may seem almost the same as another, yet to the practical buyer and valuer there may be a difference in yield of anything from 4 to 8 per cent., which would mean a considerable difference in the value of each fleece. All wool is bought on a clean-scoured basis, that is to say, the buyer considers the count or spinning quality of the wool, and its probable yield, and the price is arrived at on the clean-scoured limits of that class of wool on the date of purchase. Take, for instance, a bale of merino, 64's quality, yielding 50 per cent., i.e., half is wool, the other half consists of yolk, dirk, &c., and is worth 58 clean-scoured. Its value is calculated in the following way:—

$$\frac{50 \times 58}{100} = 29\text{d. per lb.}$$

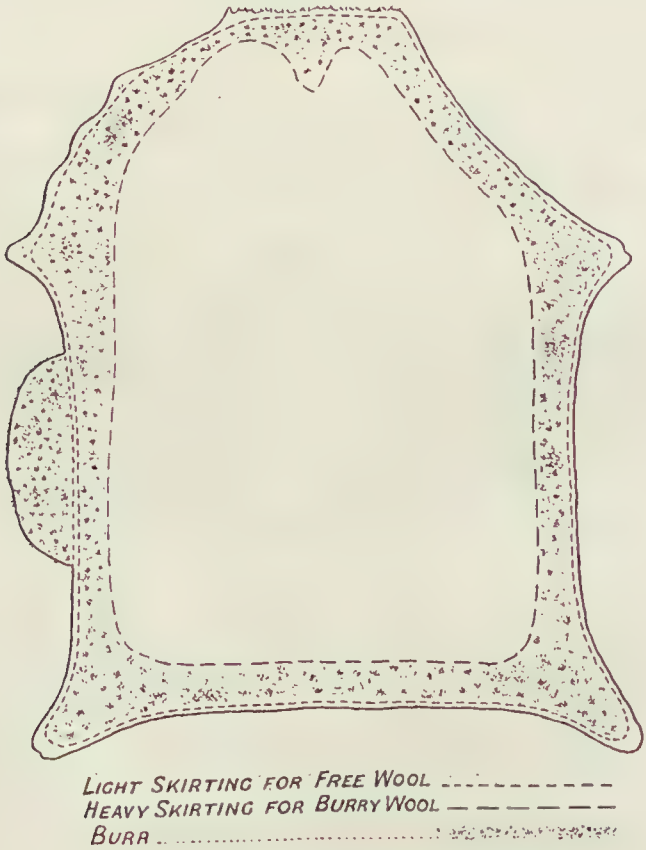
From this amount, charges for commission, &c., must be deducted.

Further, various circumstances, unnoticed when happening, may lead to the deterioration in the value of wool. Windy weather may occur when sheep are on fallow ground, with the result that extra dust will lodge in their fleeces, though the flock-owner may be quite unconscious of it. Of course, it may happen that a buyer will have filled his order just before a lot is offered; this naturally lessens the competition for that particular lot. On the other hand, he may during

the sale receive a cable to raise his limits, thereby increasing the competition.

If fleeces be properly skirted, that portion remaining on the table will be of fairly uniform quality. Thus any one buying or selling can estimate its value easily and quickly.

The method of skirting is as follows:—Skirt from the rear of the forelegs towards the neck, taking off all sweaty locks and burr if they be light; if heavy, leave on and skirt lightly, not taking off any wool as good as the main fleece. Having skirted up to the neck on both



Outline of Fleece showing Method of Skirting.

sides, turn the fleece down level with the shoulders, and skirt both sides down to the britch. Should the hind legs or britch be inclined to be hairy, skirt the wool all off. Then turn britch up one-third of the way, and throw one side right across the table to the other; the operator should then take the back, which is now in the centre of the table, over towards himself, and roll the fleece from britch to neck. In this way all the shoulder, neck, and rib wool, always the most attractive portions of a fleece, will be exposed to view; and the flock-owner should always make a point of showing the best part of the wool. A common method is to throw both ends in, and then put both sides to the centre,

and roll the fleece up and down the centre of the table. The drawback of this method is that it leaves exposed all the back wool.

The skirtings should be sorted into classes according to the number of sheep shorn, details of which will be given at a later period.

It is difficult to lay down any hard-and-fast rule as to how many classes should be made; this very largely depends on the number and class of sheep shorn. This much may, however, be definitely stated—

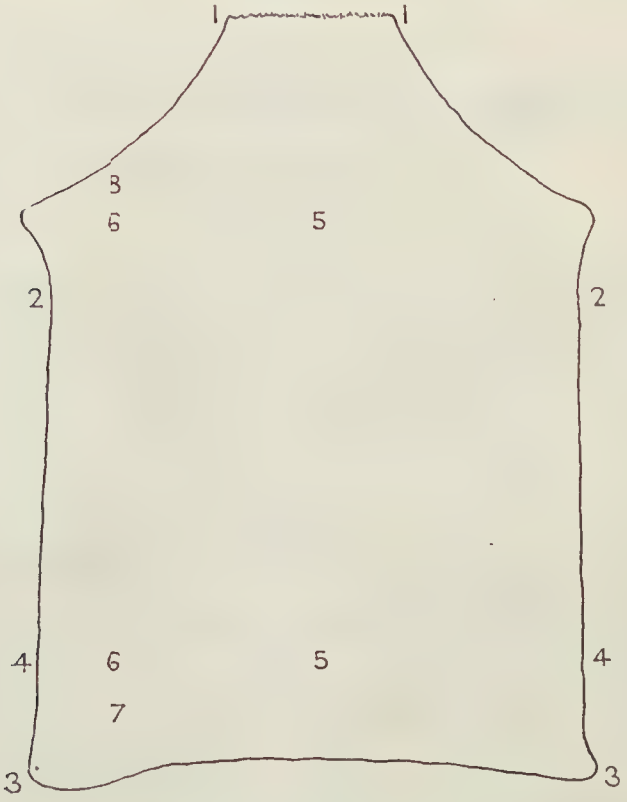


Diagram showing Correct Method of Rolling.

Order of rolling 1 to 2 and 3 to 4
2 to 2 and 4 to 4
5 to 6 and 5 to 6
Then roll from 7 to 8

Classing.

it is just as big a mistake to overclass as to underclass, and the putting up of star lots should always be avoided.

A farmer going into the market to-day and purchasing, say, 500 comebacks, will almost invariably find, when classing their wool, a fair percentage of quarter-bred and half-bred fleeces. In many instances, such wool is all put into one class and branded comeback. A buyer after comeback wool, on examining such an ill-assorted lot, refuses to

bid for it. Competition is thereby lessened, and often this badly classed wool falls into the hands of speculators, who class it into even lines suitable for the trade.

Growers should class their wool evenly and honestly, and bales should be pressed neatly and branded clearly. Wool so presented will certainly command more spirited competition than if it is badly classed and packed.

(*To be continued.*)

ORCHARD AND GARDEN NOTES.

E. E. Pescott, F.L.S., Pomologist.

The Orchard.

Cultivation.

Orchard ploughing should now be finished, and the main work for the next few months will be an endeavour to keep the soil surface loose, friable, and well opened. The consolidation of the surfaces must be avoided, as a hard, compact surface means the loss of much soil moisture, by capillary attraction. So that after rains, heavy dews, the spray pump and other traffic, it will be as well to run the harrows over the surface of the soil, so as to keep the surface well broken and to maintain a good earth mulch. If the harrows are not sufficient to break the clods, a spiked or heavy roller should be drawn over it, and then harrowed. If the weather is at all dry it is advisable to plough only as much as may be harrowed in the same day. By immediately following up the ploughing with harrowing a minimum amount of moisture is lost by capillarity.

Green manure crops should now be ploughed under, and should they be very abundant in growth, a roller should be run over them and ploughed with a coulter attached. Any of these means will serve to get the crop underground, which is a desideratum.

In addition to the retention of soil moisture, cultivation of the orchards will suppress the weeds which rob the trees of food and moisture. The suppression of weeds is an important work in the spring and summer, and they should be rigorously hoed or cultivated out.

Spraying.

Spraying for all pests and diseases is, at this time of the year, an important work in the orchard. Bordeaux or lime sulphur spraying for the black spot of apples and pears, for scab and shothole in peaches and apricots, for the leaf curl of the peach and rust of the plums and peaches, should now be completed.

Where there are indications that previous sprayings have not been thoroughly successful, a weak lime sulphur spray should be given.

Wherever they are present, nicotine sprays should be given to combat the peach aphis, and the pear and cherry slug. For the latter pest, arsenate of lead should not be used if the cherries are within a month of ripening. Arsenate of lead is so tenacious, and thus it is likely to remain on the fruit until it is ripe, when it would be dangerous to the consumer. Thus, while this property of remaining on the fruit

for a considerable time is of great value in the Codlin Moth spraying, it is quite of the opposite value when used for the pear and cherry slug. Either tobacco water or hellebore is useful for the eradication of this pest, as these substances do not remain long on the trees, and they are quite as effective as arsenate of lead. Even a dry dusting with lime or with ordinary soil will keep the slugs in check.

For cherry aphis, the trees should be sprayed at once with nicotine-sulphate.

Codlin moth spraying, too, will be in evidence this month. It is generally assumed that the appearance of the moth is coincident with the bursting of the flowers. This is not always so—the moths frequently come slightly later than the blooming period. Owing to the rapid expansion of the fruit, it is well to follow the first spraying with a second in a week or ten days' time. Arsenate of lead is still the spray for the Codlin moth, nothing having been found to supersede it.

Arsenate of lead may be mixed with nicotine sprays, or with Bordeaux mixture, without any detriment to either spray, if necessary.

The Vegetable Garden.

A good tilth, and a well-pulverized soil, are the main soil necessities in the vegetable garden this month. Frequent cultivations will keep in the soil moisture, and will obviate the necessity for surface waterings. At the same time, it should be remembered that the vegetable garden requires more water than the flower garden, owing to the quick growth of the plants. Quickly-grown vegetables are more tender and more luscious than slowly-grown ones: thus a good water supply will need to be maintained. Weeds are great moisture-robbers, and they should be kept out of the vegetable garden at this time of the year.

Late plantings of tomatoes may now be carried out; all early-planted plants should be fed, staked, and the laterals pinched back. A little bone-dust or superphosphate may be given, but these are not equal to animal manures, if the latter are available. Chemical manures should only be given in limited quantities, 6 or 7 cwt. per acre would be a heavy dressing, and this works out at nearly 3 ozs. per square yard. Vegetable growers may easily try this for themselves, and it will soon be seen that 3 ozs. scattered over a square yard of surface will appear to be a very light dressing.

French beans, carrot, parsnip, celery, radish, peas, and turnip seeds may now be sown. Seeds of cucumber, melon, and pumpkin family may now be sown in the open ground. All seedlings may be transplanted on favorable days, and it will be well to sprinkle the tops as well as to water the roots.

Asparagus beds may be top-dressed with manure, and kept well weeded. Such weak growths that are not gathered for eating should be cut out of the beds.

REMINDERS FOR NOVEMBER.

Pigs.—Supply plenty of bedding in well-ventilated styes. Keep styes clean and dry, and feeding troughs clean and wholesome. Sows may now be turned into grass run. Sows suckling young should be well fed to enable them

to produce plenty of milk. Give young pigs pollard and skim milk in separate trough as soon as they will take it, and keep them fattening from the start to get them off as early as possible. Give a tablespoonful of bone meal, or half that amount of mineral phosphate per 100 lbs. live weight in food daily. Give plenty of charcoal. If pigs are lousy, dress them with kerosene emulsion or sulphur and lard, rubbing well into crevices of skin, and disinfect styes. Pig breeding and feeding should be very profitable for a long time to come, and it should be safe to launch out now.

Sheep.—Prepare for dipping. Ascertain exact contents of bath before mixing. Powder or paste dips have the most lasting effect, particularly where lice have been bad. Hold sheep in the bath not less than half a minute; if badly infested, longer. Submerge heads twice, but allow them to rise quickly—most deaths after dipping are due to gross carelessness in holding sheep under too long, the dip wash being taken in on to the lungs. Dip rams and full grown sheep first, while bath is full, lambs last. Yard sheep over night. Dip while empty, and avoid fouling the drainer. Commence early in the day, and allow sheep to dry before nightfall. Avoid travelling long distances to and from baths, and dipping sheep while overheated. Do not roughly throw sheep in. Avoid filthy baths; this increases a dead tip in hot areas.

It is unsafe, and against instructions, to use powder dips in increased strength. Sheep badly lice-infested should be dipped directly off shears, and again in six weeks' time. Sheep with over a reasonable amount of wool on should be dipped at less strength than given on instructions. Close, fine-wooled sheep particularly so.

When constructing new dips, remember moderate-sized ones are most economical, just as efficient, and can be more easily emptied as they become fouled, and if they are near water can be quickly filled.

BEE-KEEPING.

In most districts, October is the principal swarming month; in late localities, particularly at the higher elevations, most of the swarming takes place in November. Where a honey flow is expected from Redgum or Yellow Box during December and January, it is not wise to make a further increase in the number of colonies by allowing after-swarms to come off and hiving separately, as the parent stock would be too much depleted of bees, and there would not be sufficient time for it to recover, or for the swarms to build up, before the honey flow is on, and much of it would therefore be lost.

After-swarms can best be prevented by hiving the first or prime swarm on the old stand and moving the colony from which it came to a new stand, at the same time destroying all the queen cells in it except one—the most perfect and forward one.

If no increase at all is desired, the parent colony may be left alongside the old stand on which the swarm was hived, but with the entrance facing in a different direction. When the young queen in the swarmed stock is laying, which will be in about three weeks, the hive may be gradually turned round till it faces the same way as the swarm, and, after removing the old queen from the swarm, the two stocks may be re-united, thus making a very strong colony with a young laying queen, in the best condition for storing honey and very unlikely to swarm again the same season.

The uniting of the two stocks is best done towards evening, by first giving both a little smoke between the combs and then alternating them for the time being, so that each comb from the swarm is between two of the old combs, the object being to thoroughly mix the bees. Two or three days after, the combs can be sorted; the best should be selected for the brood chamber and the others put in the upper story. Uniting should not be attempted till after the young queen is laying, otherwise there will be much fighting.

In localities where the colonies have come through the Winter very strong, there is likely to be much swarming wherever Cape Weed or some other pollen-yielding plant is plentiful, the duration of blooming and of swarming depending, of course, upon the weather.

When several days of bad weather follow the hiving of swarms, it may be advisable to feed sugar syrup (one part sugar to one part water) to keep up comb-building and brood-rearing, so as to have the greatest number possible of field bees in the hive during the honey flow later on. Honey should never be used for feeding bees, unless it comes from an apiary which has been absolutely free from disease for at least two years.

The Finest Strain of

HUNTER-RIVER LUCERNE

— IN AUSTRALIA —

"Pilca-Butta"

Strain

THIS SEED was selected by the N.S.W. Government as the sample sent to London for the British Empire Exhibition, for Exhibition of Australian Products.

We have again been appointed **SOLE DISTRIBUTORS** of this fine Strain, and Customers can therefore be assured of getting the Genuine Broad-leaved Hunter River Lucerne, passed by the Government here as being free from Dodder and other Weeds.

This Seed is Specially Re-machine Cleaned by most up-to-date machinery at our Bulk Stores, thus increasing its germination qualities. Recent Tests show growth of from 95 to 100 per cent.

The ordinary farmer's dressed samples do not give this standard of growth, as such samples contain a fair percentage of immature and light-weight seed. Thus a lesser amount of re-cleaned seed is required to sow an acre, which, added to a higher germination attained, gives the acme of success in the initial stages of establishing a Lucerne Pasture.

SAMPLES AND PRICES ON APPLICATION

POSTED FREE ——— SPECIAL SPRING LIST

Summer Fodder Plants, &c.

12 Pages of Valuable Information :: :: Fully Illustrated

LAW, SOMNER Pty. Ltd.

— Established over 75 Years —

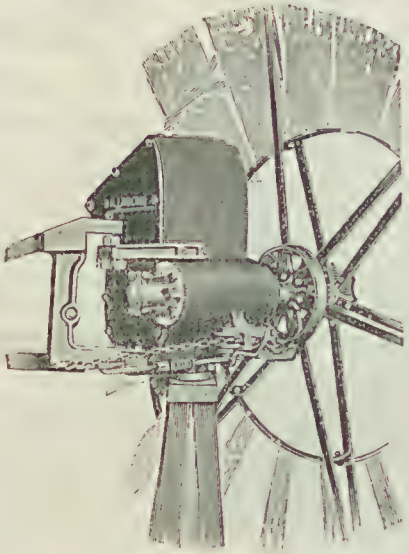
Seed Merchants and Nurserymen

Block Place & Swanston St., Melbourne

The leading Agricultural Seed House in Victoria

Enclosed-gear "Billabong" Windmills

ALL WORKING PARTS RUN IN AN OIL BATH



ONE OILING LASTS A WHOLE YEAR

The Windmill with a Life-Time of Service

If you are interested in Windmills, get full particulars of the ENCLOSED-GEAR "BILLABONG."

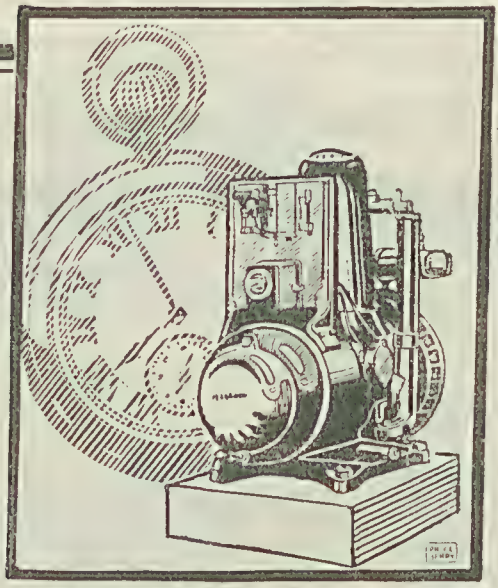
This Mill will prove a very profitable investment to the users of Windmill power, as the first cost will be about the only outlay needed where an Enclosed-Gear "BILLABONG" is installed. Weather influences cannot affect the working parts, and, with its unsurpassed oiling system, friction and wear and tear is practically nil.

JOHN DANKS & SON PTY. LTD.

DANKS

391-403 BOURKE ST. MELB.

324-330 PITT STREET, SYDNEY



As Compact as a Watch—
DELCO LIGHT

The Ideal Electric Lighting Plant for the Country Home—

YOU'LL marvel at the compactness of DELCO LIGHT. Here is a plant where every useless, makeshift part has been eliminated—where awkward mechanisms that do things in a roundabout way have been so simplified that freedom from trouble is assured.

There are no belts, pulleys, chain drives, gears, elaborate cooling systems, and other troublesome paraphernalia in the DELCO LIGHT. Nothing to rob the engine of power that should be turned into electricity. Scarcely anything to get out of order.

So that the compactness of DELCO LIGHT means something more than mere saving of space—it guarantees unusual efficiency, economy, freedom from trouble, and such utter simplicity that a child can operate and attend to it without danger.

For farms, country homes, hotels, shops, guest and week-end homes, DELCO LIGHT is altogether an ideal proposition.

Write for fuller particulars of this splendid plant to-day.

WARBURTON, FRANKI (Melb.) LTD.

380-382 BOURKE ST., MELBOURNE

(Opp. Danks') ——— *Phone Cent. 8888—4 lines*

Wool is the Test of Quality
IN
SHEEP DIP

The excellence of "VALLO" Powder Sheep Dip is endorsed by well-known Sheep-breeders. Read what one of the principal users writes:—

BOONOKE NORTH STATION,
Widgiewa Siding, N.S.W.,
18th Dec., 1924.

Messrs. A. Victor Leggo & Co.,
497-503 Collins Street,
MELBOURNE.

Dear Sirs,

We wish to say that we have used your Dip, for both spraying and dipping, with great success. We find "VALLO" is easy to mix (which is an important point), and we consider it equal to, if not better than, any other brands of dip we have used, and certainly much cheaper.

Yours faithfully,
For F. S. FALKINER & SONS Ltd.,
(Signed) OTWAY R. FALKINER,
Manager.

"VALLO" Powder Sheep Dip—72/6d. per Case of 10 x 10 lb. pkts., sufficient to do approximately 2,500 sheep.

Manufacturers: **A. VICTOR LEGGO & CO.**
497 COLLINS STREET, MELBOURNE.
AGENTS ALL STATES.

BARK

Consign your Bark to

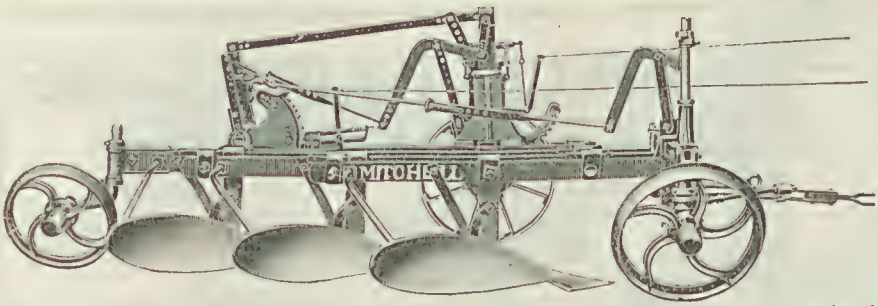
S. P. REYNOLDS & CO.

Bark Merchants and Tanners

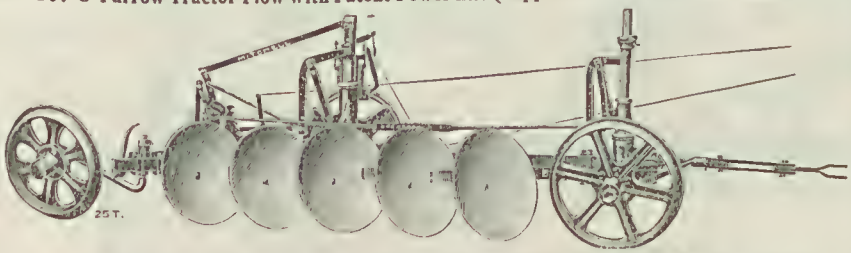
MACAULAY ROAD, NORTH MELBOURNE

HIGHEST PRICES PAID FOR
BEST BLACK & GOLDEN WATTLE

Consign direct to "Reynolds" Goldsbrough Mort's Siding, Macaulay



No. 61T. 3-Furrow Tractor Plow with Patent Power Lift (Supplied with Knife or Circular Coulters)



No. 25T. 5-Furrow Disc Tractor Plow with Patent Power Lift. All sizes made.
No levers. A pull on a rope gives ANY DEPTH WHILE PLOWING. No other lift does this.

EASY TERMS. WRITE. PLEASE MENTION THIS.

MITCHELL AND CO. PTY. LTD.
Office and Factory: West Footscray
Showroom: 596 Bourke St., Melb.
N.S.W. Branch: Parkes

New Zealand Loan & Mercantile Agency Co. Ltd.

COLLINS STREET, MELBOURNE

LIBERAL CASH ADVANCES

WOOL, GRAIN, SKINS, HIDES, TALLOW, BARK, STOCK AND STATION AGENTS ON COMMISSION ONLY

LOCAL SALES AND SHIPMENTS OF BUTTER UNDERTAKEN ON OWNER'S ACCOUNT

Agents for

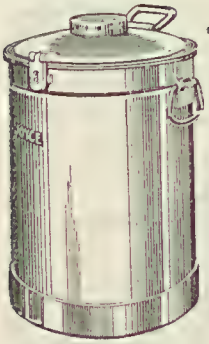
PAGE'S WIRE STRAINERS IRONSIDE WIRE CUTTERS
BAILEY'S ANTI-MAMMITIS LOTION
FATERINE, A NATURAL CALF AND PIG FOOD

COOPER'S SHEEP DIP

COOPER'S MILK OIL FLUID COOPER'S WORM TABLETS
WEEDICIDE MEDICO COOPER'S LAVENE

SALES OF SHEEP & CATTLE

Held Weekly at Newmarket



"JOYCE" DAIRY CANS

ENTIRELY SEAMLESS

MILK CANS		CREAM CANS	
20 Quart	24/-	3 Gallon	21/6
24 ,, ...	26/-	5 ,, ...	23/-
30 ,, ...	28/-	8 ,, ...	29/6
40 ,, ...	32/-	10 ,, ...	31/-
50 ,, ...	35/-		

Name plates free, and freight paid per goods to nearest station in Victoria.

"JOYCE" Milk Coolers for the farm

No. 1— 90 Gal., 12" x 24", £7 complete.
No. 2—160 ,, 18" x 27", £8 ,,
No. 3—220 ,, 20" x 30", £9 ,,

A complete cooler consists of cooler, strainer, vat and tap, galvanized brackets, unions and hose.

"JOYCE" Separator. It sells because it excels!

Perfect skimming, easy running, simple and strong construction.
Sizes from 10 to 115 gallon. Cash or easy terms.

"JOYCE" Products for SATISFACTION

Obtainable from Butter Factories, Stores, &c., or Manufacturers—

A. JOYCE & Co. Pty. Ltd.

595-597 ELIZABETH ST. MELBOURNE.

WE CATER FOR YOUR REQUIREMENTS in ENGINEERING, ELECTRICAL, and BUILDERS' SUPPLIES

Machines—New or Secondhand—on indent at specially attractive prices.

Full particulars can be obtained at our Stand in Smith St., Royal Show Grounds.

SPECIALITIES

"SIDOL" Anti-Borer and Wood Preservative.
"SIDEROSTHEN" Anti-Corrosive Paint.
"ROK" Bituminous Roofing, Damp Course and Water-proofing Compounds.

BELTING Rossendale Hair Belting, Ormerod's English Leather & Australian Leather.

FLATHER'S Electric Motors and Dynamos.

Pulleys, Lathes, Drilling Machines, Hack Saws, Files, Valves, Packings, Hair Felts, Insulating Papers, Switch Gear, and all General Engineering Requisites.

WM. CROSBY & CO.

Phone C.11290 C.11430

488-90 COLLINS STREET, MELBOURNE.

DEPARTMENT OF AGRICULTURE, VICTORIA

NOW AVAILABLE

Handbook of Potato Diseases in Australia—and their Treatment

BY D. McALPINE.
GOVERNMENT VEGETABLE PATHOLOGIST

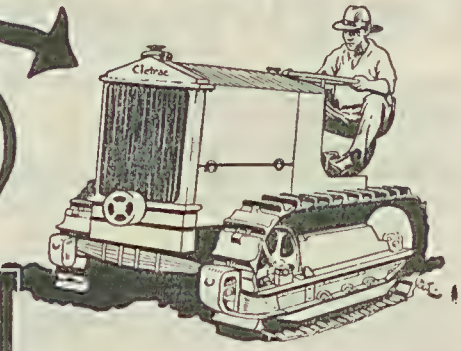
With Appendices by W. Laidlaw, B.Sc. (Biologist), on **Eel Worms;** and C. French, Jnr. (Government Entomologist), on **Insect Pests of the Potato.**

235 Pages (Cloth). 58 Full Plates. 176 Illustrations. **Price, 5/-** Postage: Commonwealth, 2d.; New Zealand, 8d.: British and Foreign, 1/4.

Applications accompanied by Postal Note or Cheque, covering Price and Postage, to be forwarded to **The Director of Agriculture, Melbourne, Victoria.** Remittances from beyond the Commonwealth to be made by Post Office Order.

Harvest With a

Cletrac
REG. U.S. PAT. OFF.



TANK TYPE TRACTOR

Be Prepared

The wise Farmer is the one who purchases his "Cletrac" NOW. By so doing he will ensure early delivery, and will have plenty of time to get familiar with it before harvest.

The "Cletrac" can be driven from the seat of your Harvesting Machine, for it can be fitted with a thoroughly efficient

ONE MAN CONTROL

No matter what condition the crop is in, heavy or light, "Cletrac," being a one-gear governed machine, can be set to suit Every Requirement.

Pictorial Literature Post Free.

TRACTION AUSTRALIA
PTY. LIMITED.

469 Flinders St. - MELBOURNE
383 Sussex St. - - SYDNEY

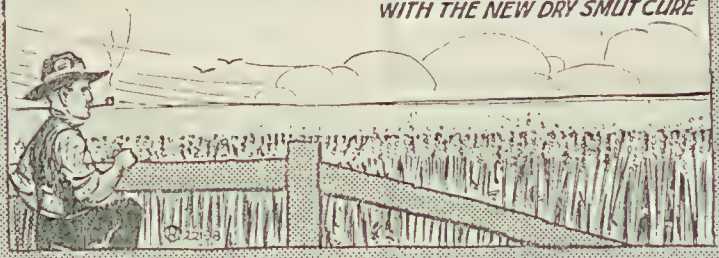
LILYDALE LIME For the LAND

Farmers who have not used **Burnt Lime** should try it. The action of Burnt Lime on the land is **Immediate.** Farmers have the opportunity of obtaining the **well-known Lilydale Agricultural Lime.**
ANALYSIS—98% Calcium Oxide.

Apply—
DAVID MITCHELL ESTATE,
Sole Proprietors.

Head Office:
OLIVER'S LANE, MELBOURNE
Tel. Central 5725 and 5726.

ML
SUCCESS ASSURED
WITH THE NEW DRY SMUT CURE



SMUTOL
FOR PICKLING SEED WHEAT
APPLY TO LOCAL AGENTS OR
MT LYELL CHEMICAL WORKS
COLLINS HOUSE MELBOURNE

This Journal
offers exceptional advantages
for Advertising

Circulates throughout the **Country Districts** of **Victoria** and amongst **Farmers** of the **Commonwealth,** reaching also country professional men, tradesmen, schoolmasters, teachers, and the like.

Exceptionally satisfactory results have followed the advertising of Stud Stock in this Journal.

Rates on application to the Official Canvasser
Mrs. Hemming, 38 Seymour Avenue, Malvern

DEPARTMENT OF AGRICULTURE, VICTORIA

Red Poll Dairy Herd

The Department has now completed the orders for calves that were booked ahead of calving when the advertisement was withdrawn; consequently the booking of orders for bull calves from the forthcoming calvings has now been resumed.

BULL CALVES are sold for delivery at a month old at prices based approximately on the actual milk and butter fat record of the dam at the rate of 1s. per lb. of butter ***fat*** yielded. Thus a calf from a cow with a 400 lb. butter fat record is sold for 20 guineas, one from a 300 lb. butter fat cow for 15 guineas, and so on. Bull Calves *ex* heifers on their first calf are sold for a set price of 10 guineas.

(For Record of Yields of dams see Red Poll Herd Book.)

SIRES IN USE:

VICTORIA VOLCANO (322 A.)

Sire: Nicotine (69 A.A.) by Acton Dewstone (imp.) 9524 (4 A.A.).
Dam: Tonga (253 A.) by Honingham Archbishop (imp.) 9702 (48 A.A.).

Tonga's butter fat yields for 6 successive lactation periods are as follow:—1916, 341 lb.; 1917, 398 lb.; 1918, 419 lb.; 1919, 479 lb.; 1920, 428 lb.; 1921, 362 lb.

BELLIGERENT (Imported) 11096 (8 A.A.)

Dam's Record (1st milking) 7144 lb. milk.

Dam's Dam's	,,	14533 lb. milk	...	4 years	average	12871 lb. milk.
Sire's Dam's	,,	10370 ,,	...	7 ,,	,,	9354 ,,
Sire's D. Dam's	,,	9510 ,,	...	12 ,,	,,	8033 ,,
G. Sire's D. Dam's	,,	10215 ,,	...	7 ,,	,,	9386 ,,
G.G. Sire's D. Dam's	,,	12565 ,,	...	10 ,,	,,	8853 ,,
G.G.G. Sire's D. Dam's	,,	10088 ,,	...	2 ,,	,,	9754 ,,

BIT O' 'BACCA (Vol. 3)

Sire: Nicotine (69 A.A.) by Acton Dewstone (imp.) 9524 (4 A.A.).
Dam: Nictitana (311 B.) by Nicotine (69 A.A.).

Nictitana's butter fat records for 6 successive lactation periods are as follow:—1918, 450 lb.; 1919, 396 lb.; 1920, 393 lb.; 1921, 465 lb.; 1922, 524 lb.; 1923, 536 lb.

Inspection of the Herd is Invited.

Visitors will be met at the Station on notifying the Manager, State Research Farm, Werribee.

Application for purchase to

Dr. S. S. CAMERON, DIRECTOR OF AGRICULTURE, MELBOURNE.

DEPARTMENT OF AGRICULTURE

GOVERNMENT COOL STORES

VICTORIA DOCK

The Stores have a capacity of **743,980 cubic feet insulated,** and are capable of holding **372,000 boxes of butter,** or **248,000 cases of fruit,** or **335,000 carcasses of lamb and mutton.**

Electric motor power totals 900 H.P.

Produce can be placed on conveyors at any point and mechanically carried to any chamber in the building, or conveyed from the chambers direct into the ship's hold.

The Railway Department Goods Sheds are adjacent to and connected with the Cool Stores by direct lines; delay and exposure of produce through shunting in the Spencer-street yards, or cartage, are thus avoided. The Stores are situated in close proximity to the Victoria Dock, where vessels drawing up to 30 feet of water can be berthed; excellent facilities for the efficient and economical treatment and shipment of frozen and perishable products are provided.

Expert Officers are connected with every Branch, so that any one requiring information regarding the production, preparation, and shipment of produce can rely upon being promptly supplied with up-to-date information upon all matters.

DEPARTMENT OF AGRICULTURE

GOVERNMENT COOL STORES

VICTORIA DOCK

Facilities are provided for producers and smaller exporters of the various kinds of produce, so that direct shipments on their own account may be undertaken. The Government ownership and conduct of Cool Stores places producers in an independent position, and, in addition, preserves an open channel for the carrying on of the export trade in perishable products.

The Department of Agriculture will receive, handle, freeze, store, and ship **Butter, Cheese, Eggs, Fruit, Meat, Poultry, Rabbits and Hares, &c.,** for producers and exporters.

Produce to the value of over **£30,000,000** has been treated at the **Government Cool Stores.**

GOVERNMENT COOL STORES, VICTORIA DOCK (Dudley St.)

Telephones:

Office: 10383 Central. **Superintendent and Engineer-in-Charge. 10382 Central.**

SCALE OF CHARGES, ETC.

and further particulars may be obtained upon application to the

EXPORTS SUPERINTENDENT, DEPARTMENT OF AGRICULTURE,
PRODUCE OFFICES, 605-7 FLINDERS STREET, MELBOURNE.

Telephone 9380 Central.

YATES' Reliable Seeds

ARE KNOWN AS THE

Standard of Quality throughout the Commonwealth.

OUR seed supply organization embraces every State, and we have agents in every centre all over Australia. If you do not know your nearest agent a line to us will bring a prompt reply.

Seeds in sealed and dated packets, or in bulk, are obtainable either from our agents or direct from our Sydney Warehouse, where we have a special department for executing postal orders.

Our catalogues, calendars, and many other free publications will be posted gratis on application.

N.B.—With few exceptions, we will deliver Agricultural Seeds **FREE ON RAILS MELBOURNE** at our Sydney Prices.

ARTHUR YATES & Co. Ltd.

Letters
Box 2707
G.P.O.

Australia's Greatest Seed House,
SUSSEX ST., SYDNEY

Wires
"SEEDSMAN,"
SYDNEY

By Authority: H. J. Green, Government Printer, Melbourne.

DEPARTMENT OF AGRICULTURE, VICTORIA

FRIESIANS FOR SALE

(1) BULL "VICTORIA TOPNOTE" *ex* DOMINION HYACINTH (374)

Dropped 29th August, 1923

Sire: **Victoria Songboy (359)** by Dominion Domino Dutch Boy (73).

Sire of Dam: **Oak de Kol 2nd Homestead Fobes** (imp. to N.Z. from America) (341 N.Z.F.H.B.).

Dominion Hyacinth's Record for 273 days under Government Herd Test—
11,512 lb. Milk, 479 lb. Butter Fat. Price, 40 guineas f.o.r. Werribee.

For Full Lactation Period—
13,898 lb. Milk, 589 lb. Butter Fat.

(2) Bull Victoria Patch Lad *ex* Victoria Oakdale Lassie (996)

Dropped 24th September, 1923

Sire: **Victoria Jo Patch (345)** by Longbeach Big Patch (515 N.Z.F.H.B.), *ex* Dominion Madrigal (371).

Sire of Dam: **Dominion Oakdale (342)** by Oak de Kol 2nd Homestead Fobes.

Her Dam, Dominion Proud Lassie's Record for 273 days under Government Herd Test—
11,336 lb. Milk, 3·42 Test, 387 lb. Butter Fat.
Price, 32 guineas f.o.r. Werribee.

For Full Lactation Period—
12,216 lb. Milk, 3·51 Test, 428 lb. Butter Fat.

(3) Bull Victoria Woodpatch *ex* Dominion Woodnymph (988)

Dropped November, 1923

Sire: **Victoria Jo Patch (345)** by Longbeach Big Patch (515 N.Z.F.H.B.), *ex* Dominion Madrigal (371).

Sire of Dam: **Woodcrest Jo** (imp. to N.Z. from America) (334 N.Z.F.H.B.).

Dam's Record for 273 days under Government Herd Test—
10,610 lb. Milk, 3·17 Test, 336 lb. Butter Fat.

For Full Lactation Period—
13,240 lb. Milk, 3·31 Test, 439 lb. Butter Fat.

The record of the dam—DOMINION MADRIGAL—of the sires "Victoria Songboy" and "Victoria Jo Patch" for 273 days under Government Herd Test is 11,373 lb. Milk, 3·93 Test, 448 lb. Butter Fat; and for Full Lactation Period 13,485 lb. Milk, 4·17 Test, 563 lb. Butter Fat. "DOMINION MADRIGAL" is a full sister to "DOMINION QUEEN MERCEDES," third cow of all breeds under Government Herd Test 1923, and Winner "Weekly Times" Butter Competition, Melbourne Royal Show 1923, and Champion Melbourne Royal Show 1923.

Price, 32 guineas f.o.r. Werribee.

(4) Bull Victoria Bellringer *ex* Victoria Dutchbelle (990)

Dropped October, 1924

Sire: **Victoria High Patch (537)** by Victoria Jo Patch (345).

Sire of Dam: **Dominion Domino Dutch Boy (73)** by Longbeach Primrose League (698 N.Z.).

Dam's Record for 273 days under Government Herd Test—
8,768 lb. Milk, 314 lb. Butter Fat, 3·8 lb. Commercial Butter.
Price, 22 guineas f.o.r. Werribee.

(5) Bull Victoria Bridegroom *ex* Victoria Wedding Bell (999)

Dropped 18th September, 1924

Sire: **Burnbank Iaka Segia Pietje (402)** by Alderley Segis Beets (imp.) (187).

Sire of Dam: **Victoria Milkman Jo (344)** by Woodcrest Jo (imp.) (344 N.Z.).

Dam's Record for 273 days under Government Herd Test: First Lactation Period—
6,838 lb. Milk, 3·50 Test, 239 lb. Butter Fat.
Price, 15 guineas f.o.r. Werribee.

G. Dam, DOMINION BELLE CORONA'S record for 273 days under Government Test—10,799 lb. Milk, 382 lb. Butter Fat, 436 lb. Commerical Butter. For Full Lactation Period—14,027 lb. Milk, 513 lb. Butter Fat, 585 lb. Commercial Butter.

Inspection of above Bull Calves at the State Research Farm, Werribee, is invited.

Application for Purchase to—

DR. S. S. CAMERON, Director of Agriculture, MELBOURNE

AFTER THE HARVEST!

When you have finished harvesting, what about that holiday you have long promised yourself.
Why not go to

MT. BUFFALO

An ideal place to rest, and a complete change of scenery and environment to what you have experienced all the year.

Many country people who saw the Buffalo Model at the Royal Show were amazed. They said they had no idea Victoria had such a beautiful place within its borders.

In Season at all Seasons

Summer time at Buffalo, with its profusion of wildflowers, is a delightful period. Days which are ideal for walking to the many beauty spots, nights which are cool and refreshing. Boating, tennis, mountaineering, trout fishing, and with all this, the comfort and A1. service at the beautifully appointed

GOVERNMENT CHALET.

You may not be able to spare time or money to go to resorts far afield, but Buffalo is within your reach. It is well worth a visit.

Call upon or write to the — *Ask those who have been.*

GOVERNMENT TOURIST BUREAU,
Queen's Walk, Opposite Town Hall, Melbourne

Experts will give you complete information.

The RAILWAY is the BEST WAY

Sp
630.5
V645